

VIIRS – Telecon Ocean Color CAL Val

Stennis Team
Nov 21, 2013

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P. Martinolich, A. Lawson, G. Fargion, D. Crout
USM, NRL, QNA, SDSU

Discussion today :

- 1. Cal Val Activities**
 - Gulf of Mexico --**
- 2. Aeronet Time Series**

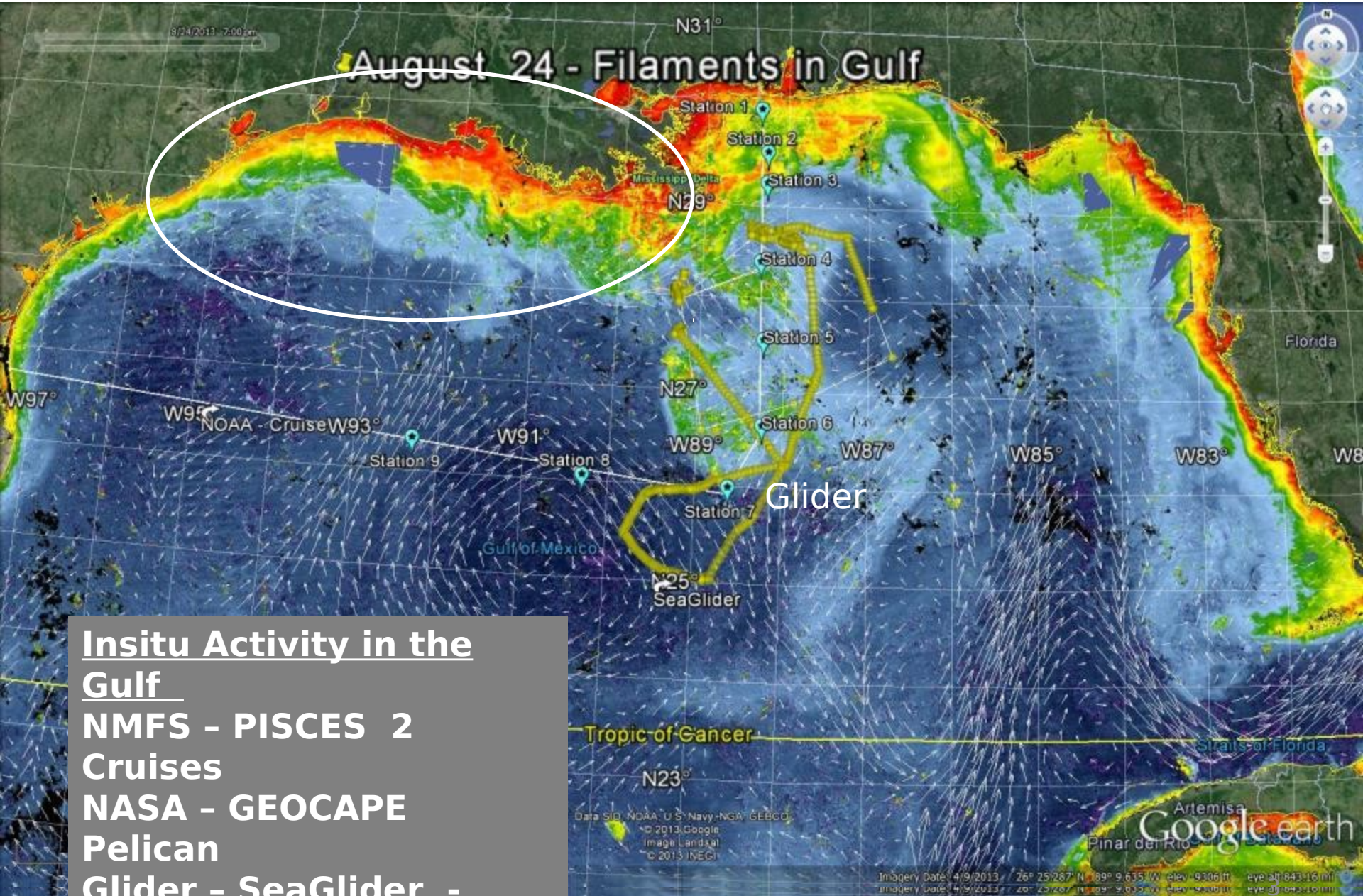
Analyses

- 3. Fisheries Cruise**

Matchup

- 4. GeoCape Matchup**
- 5. Chesapeake Bay**
- 6. Plans and Summary**

Recent Activity Ocean Monitoring the Gulf



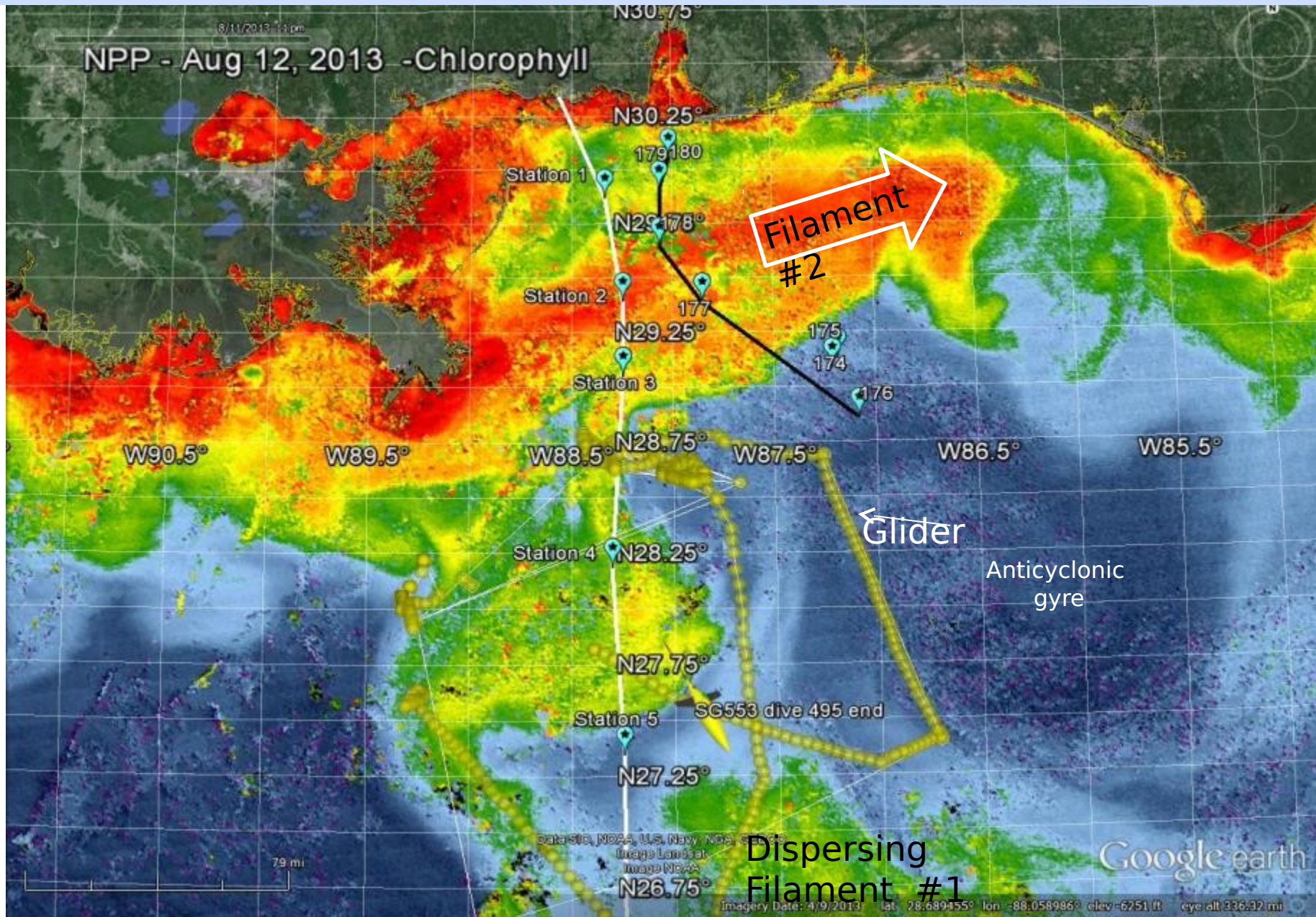
In situ Activity in the Gulf

NMFS - PISCES 2
Cruises

NASA - GEOCAPE
Pelican

Glider - SeaGlider -
NDBO - Shel

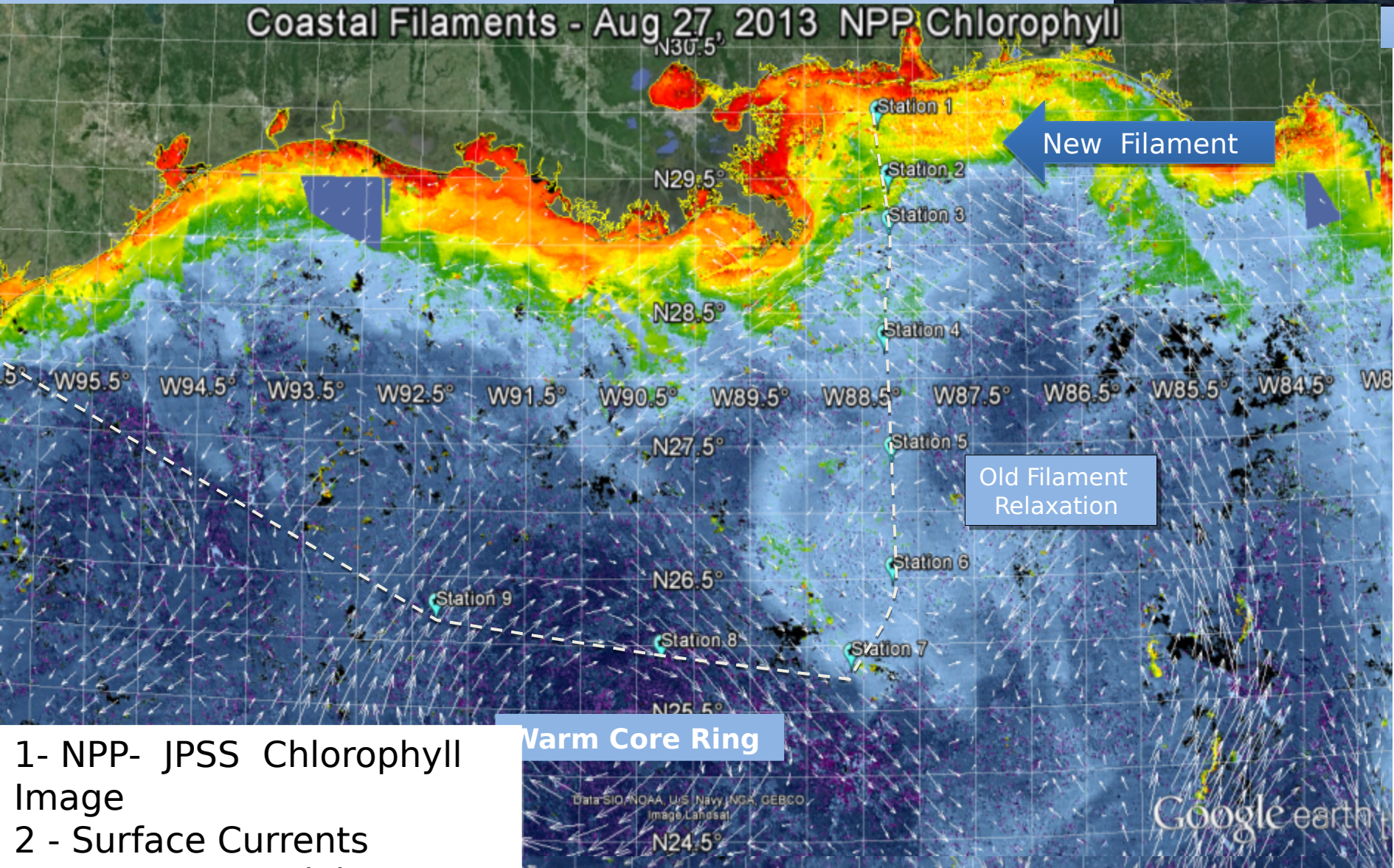
Gulf of Mexico - Activity During and Post Ongoing with GeoCape



PISCES Cruise Track Pascagoula to Browns

STATION LOCATIONS Aug 22 - 25

"NMFS - Glenn Zapfe"



- 1- NPP- JPSS Chlorophyll Image
- 2 - Surface Currents

Vertical Structure Aug 23, 2013 - Chlorophyll

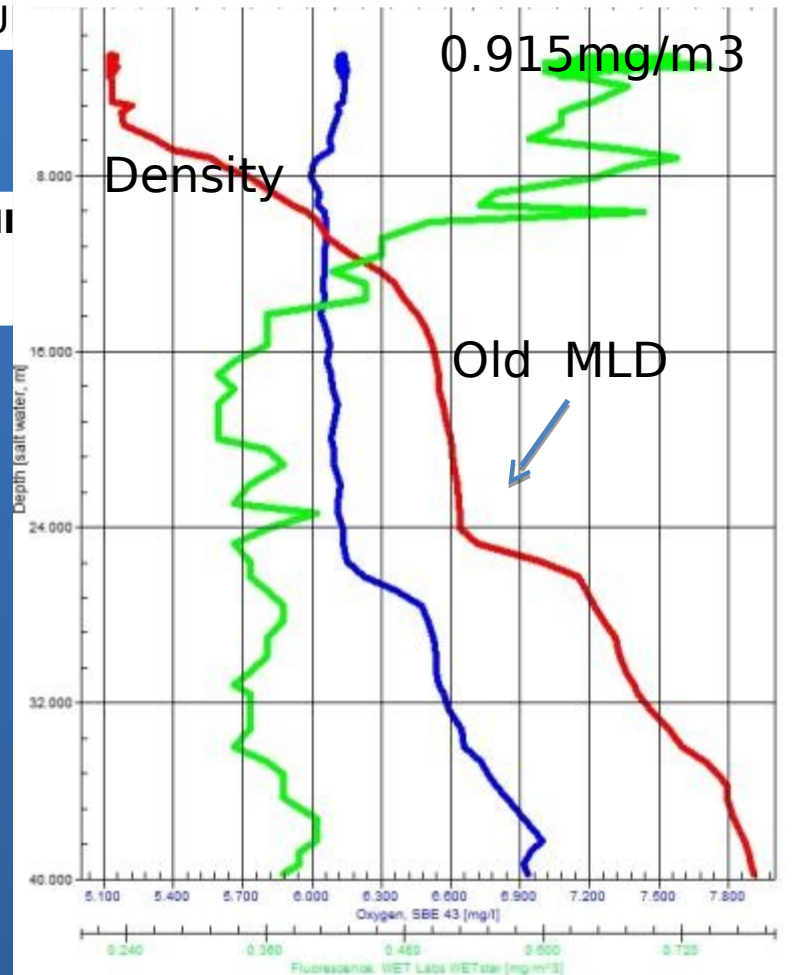
NPP VIIRS

TA STATION 3 Outside

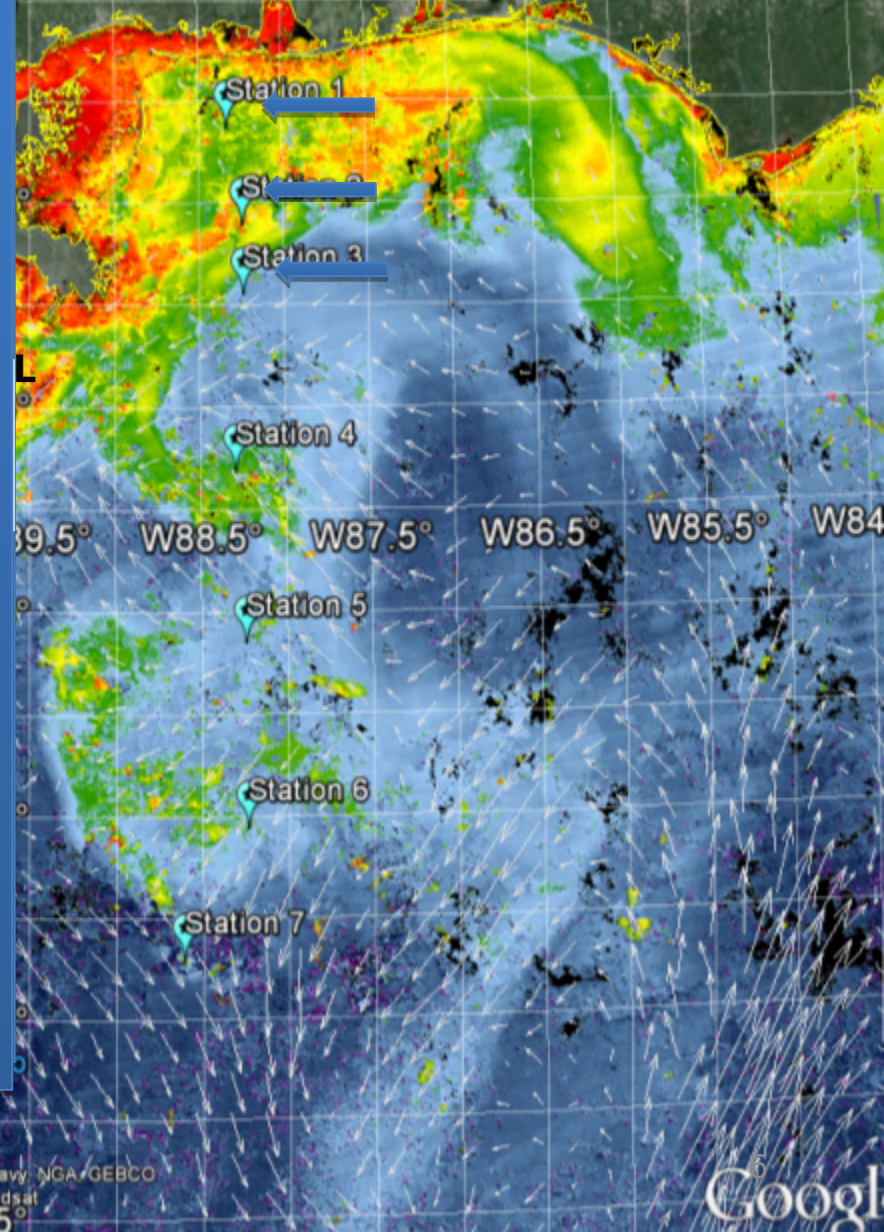
Filament

SU

MI



2013 NPP Chlorophyll

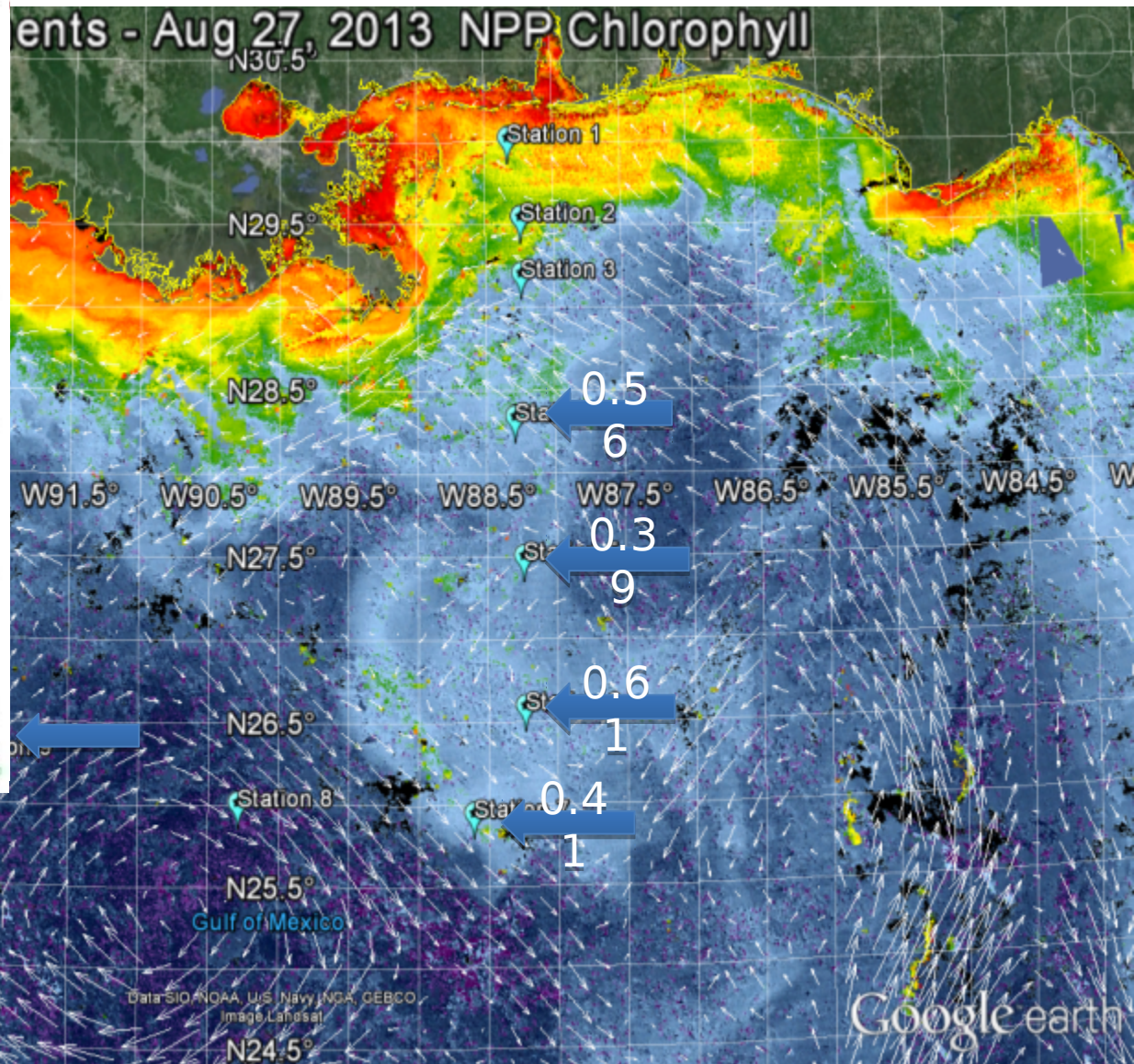
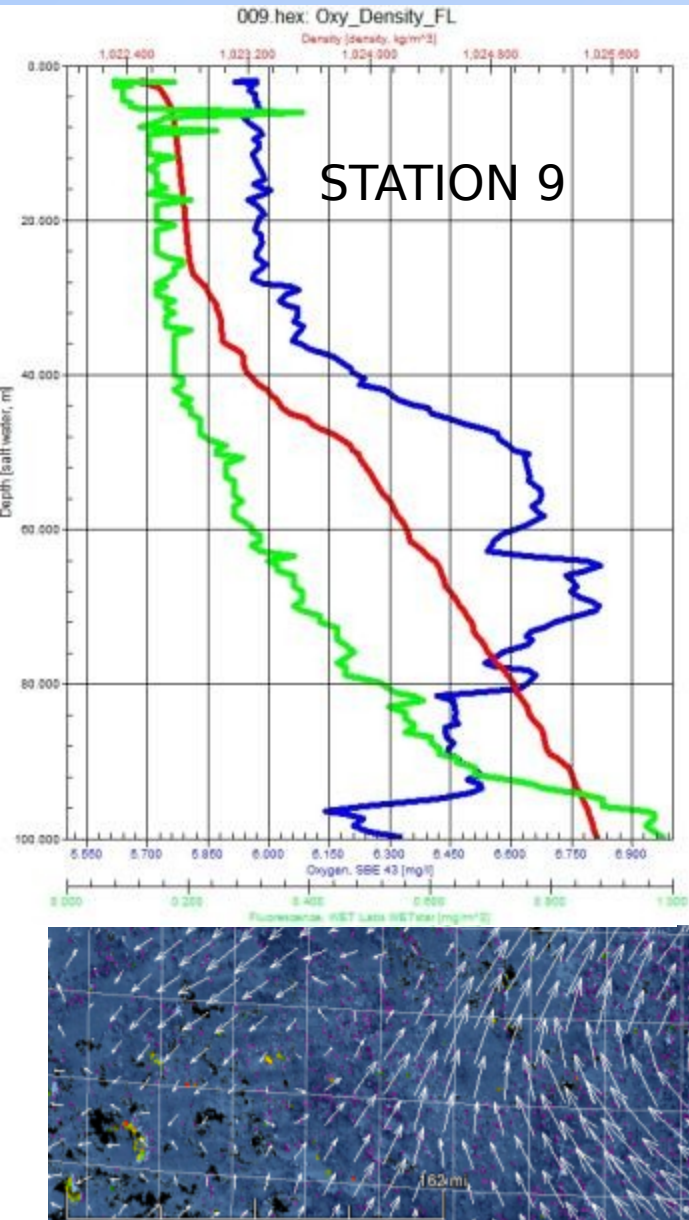


Data SIO, NOAA, U.S. Navy, NGA, GEBCO

Image Landsat

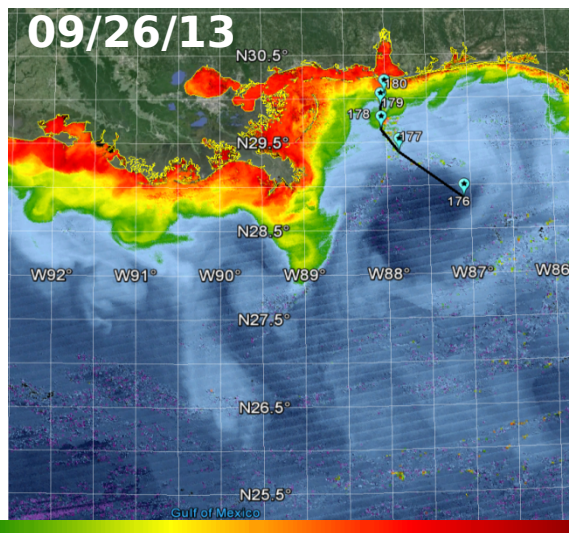
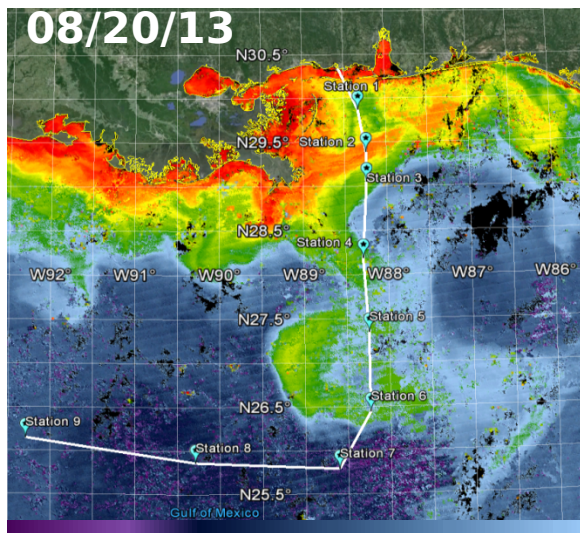
N24.5°

Vertical Structure Aug 24, 2013 - Chlorophyll NPP VIIRS



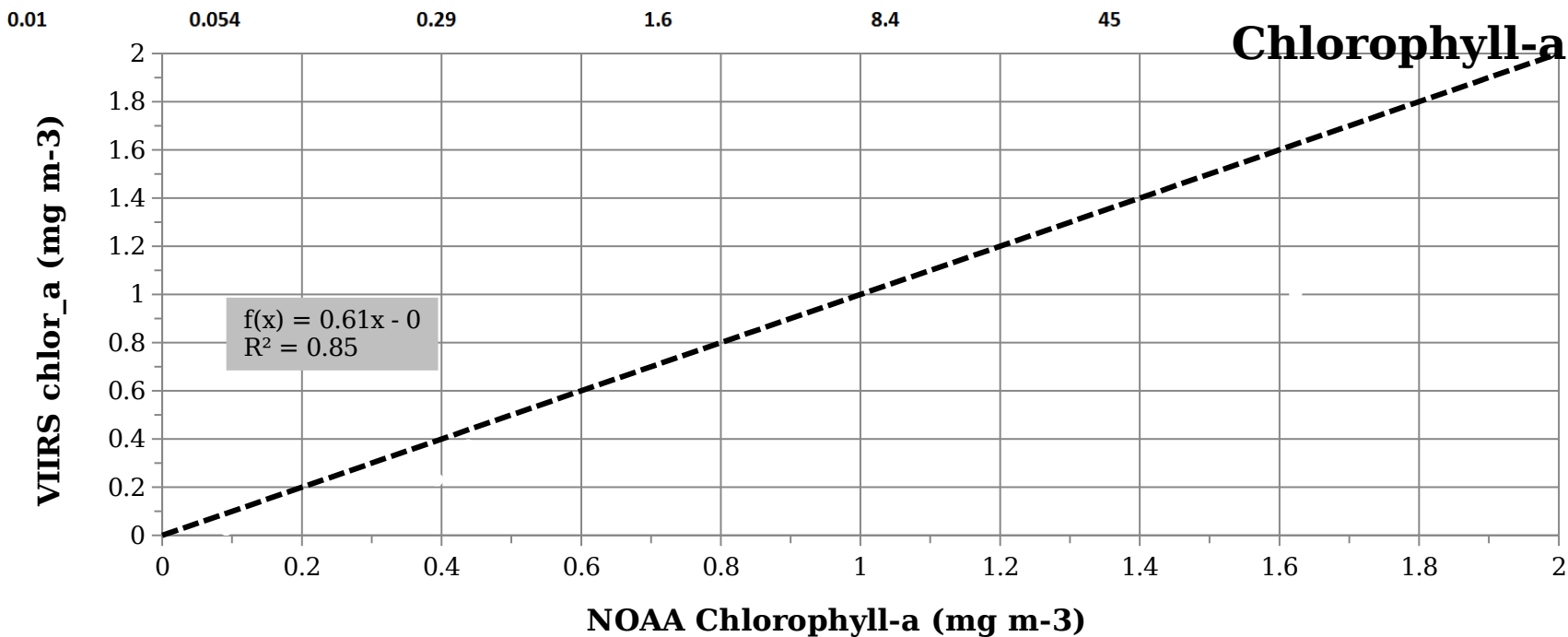
Note the Deepening of the Chlorophyll max and the “spread”⁷

NPP - Chlorophyll Validation

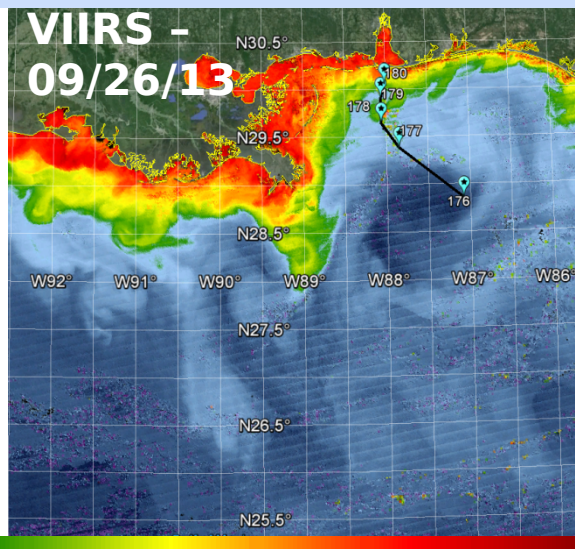
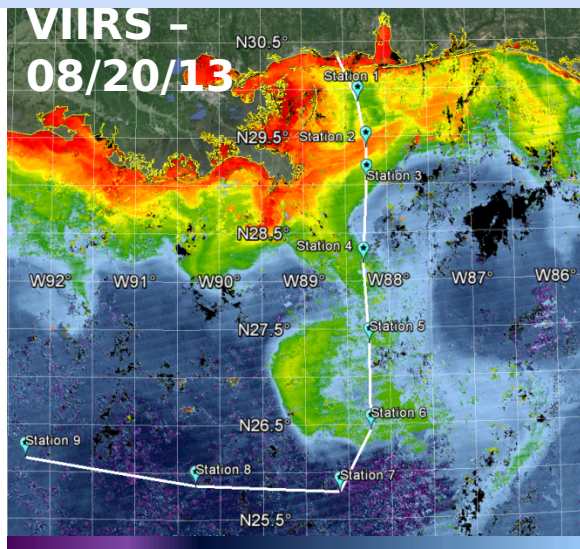


NOAA_Pisces
(08/21 - 08/23,
09/27)

VIIRS matchup,
IDPS
VOCCO



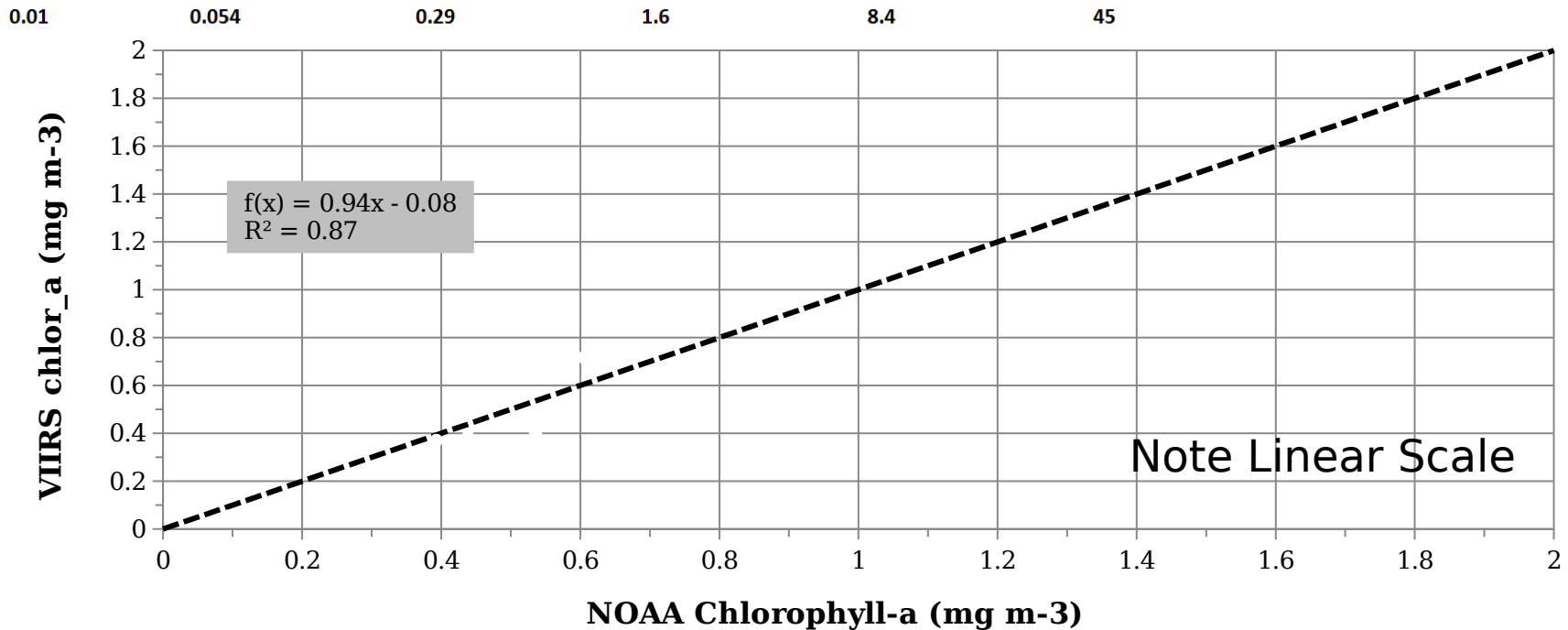
NPP - Chlorophyll Validation



**NOAA_Pisces
(08/21 - 08/23,
09/27)**

**VIIRS matchup,
APS_v4.10.0**

Chlorophyll-a



Aeronet Time Series

Analyses

WAVCIS - Gulf of Mexico Complex Waters

- High Scattering environment
- High CDOM
- level 1.5 data ➡ 2.0 screening

AAOT - Northern Adriatic Sea

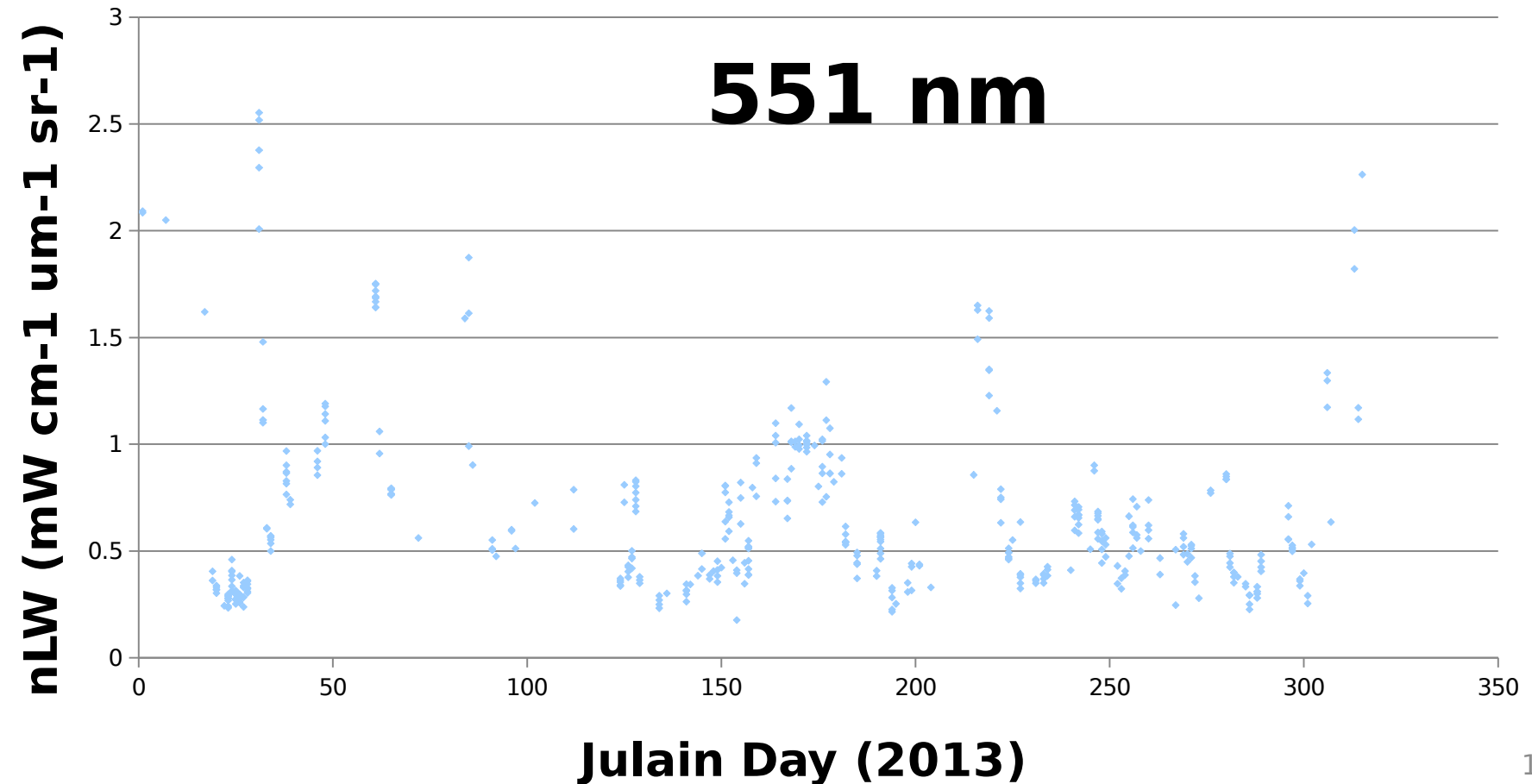
- Level 2.0 Screening
- seasonal Variable Complex waters
- River discharge and open ocean

Data matchup Exclusion criteria:

- +/- 3 hours
- Max wind speed: 8 m/s
- Min AOT: 0.2
- Min % valid pixels: 50
- Max satz: 56 degrees
- Max solz: 70 degrees
- L2flags: ATMFAIL, HILT, CLDICE, LOWNLW, LAND, HISATZEN, HISOLZEN, NAVFAIL, EPSILON, HIGLINT, MAXAERITER, MODGLINT, PRODFAIL, NAVWARN, ATMWARN

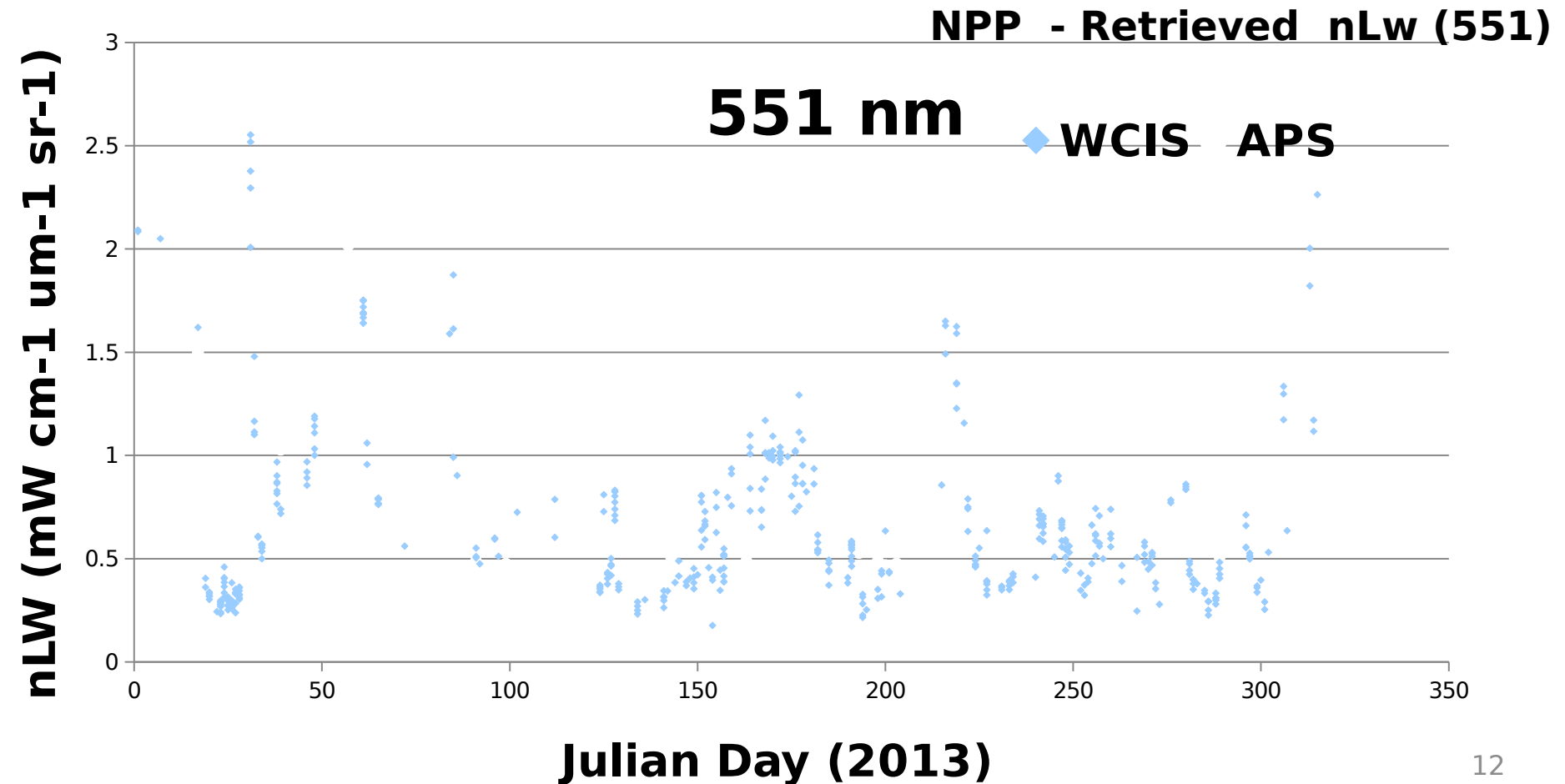
WAVCIS – SeaPrism Time Series

Define the Temporal variability at the Wavcis Site -Hourly change over year

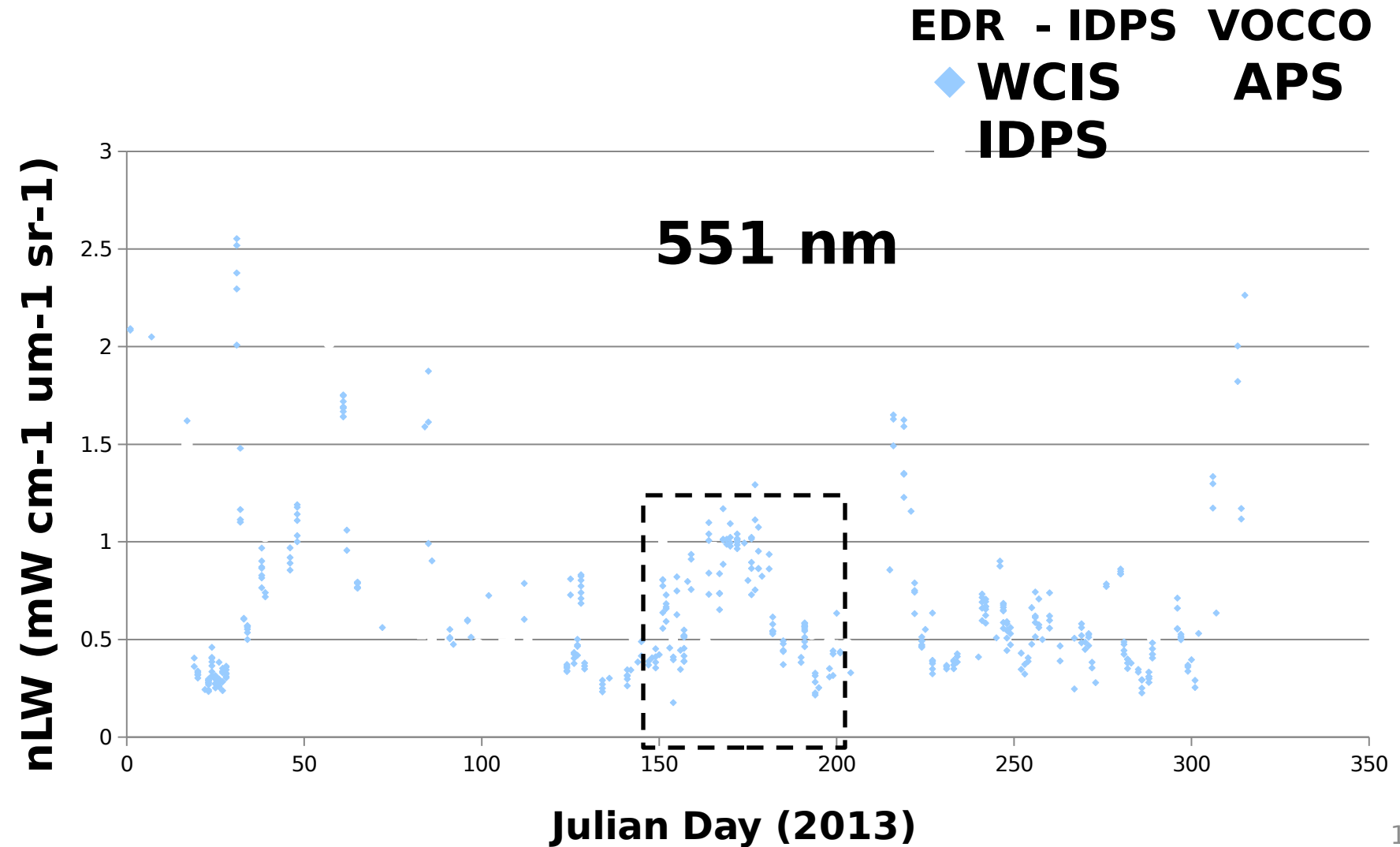


WAVCIS - SeaPrism Time Series

Temporal variability at the Site and the Matchup

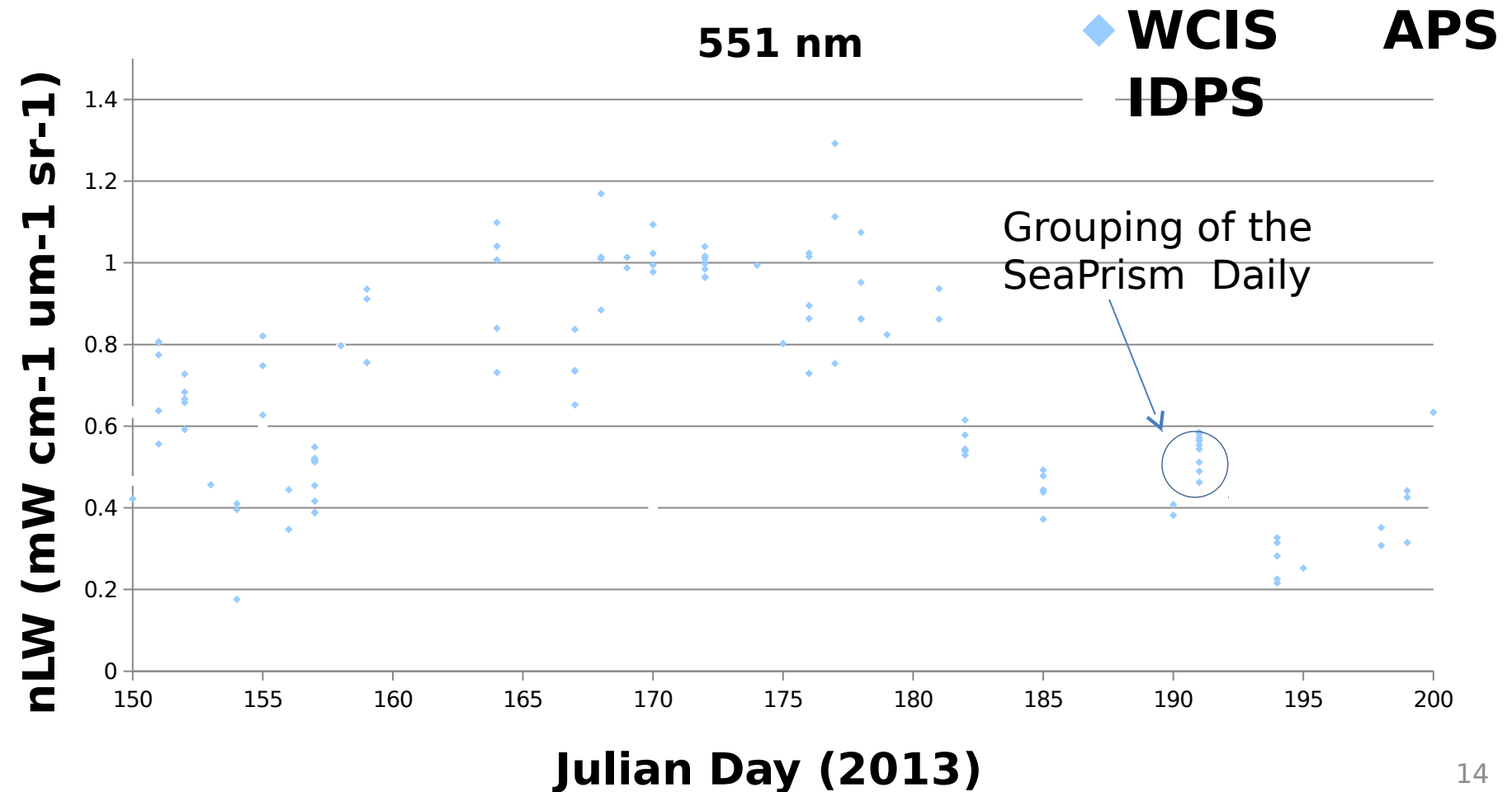


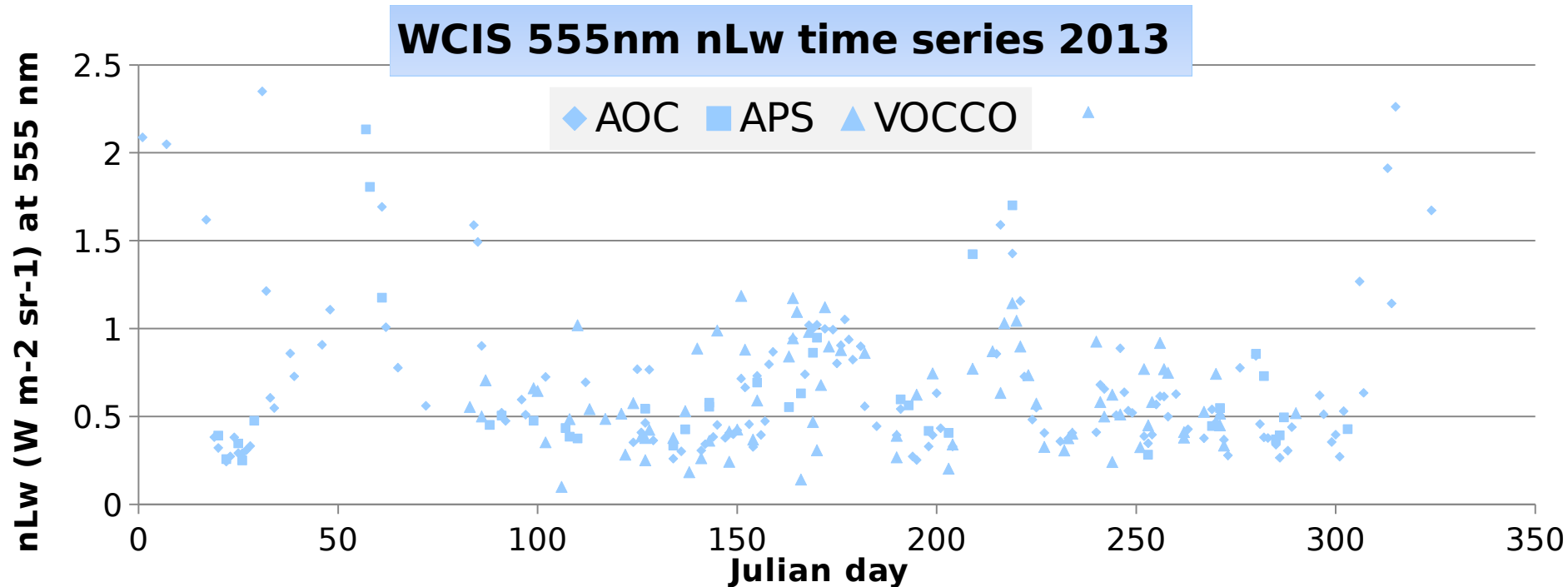
WAVCIS - SeaPrism Time Series



WAVCIS – SeaPrism Time Series

ZOOM in

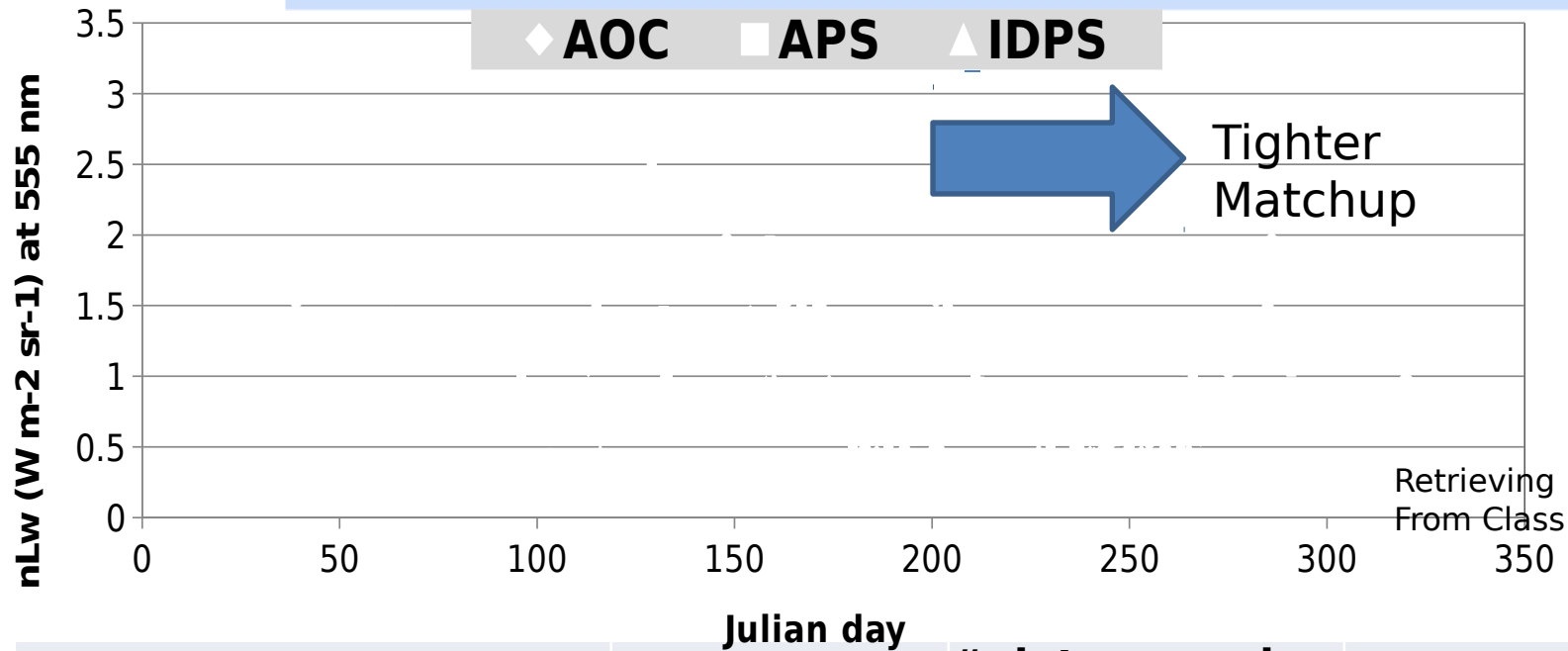




Location: WCIS (Jan1 - Nov 20)	# data records	# data records after exclusions applied	# data records after satellite flags
SeaPrism	560	453	453
APS - processing	196	54	34
VOCCO - processings	252	94	94
APS to SeaPrism matchups	43	13	7
VOCCO to SeaPrism matchups	23	17	17
Exclusion Criteria: +/- 3hrs; Max SatZA = 56°; Max SeaZA = 70°; 50% valid pixels; wind < 8m/s; max AOT 0.2			
APS to VOCCO matchups	121	30	19
* Satellite Flags: Atmos fail; High LT; cloud/ice; sea ice; low nLw; land; hi satZ; hi solZ; nav fail; High glint; max AER iteration, epsilon out of range; Moderate glint			

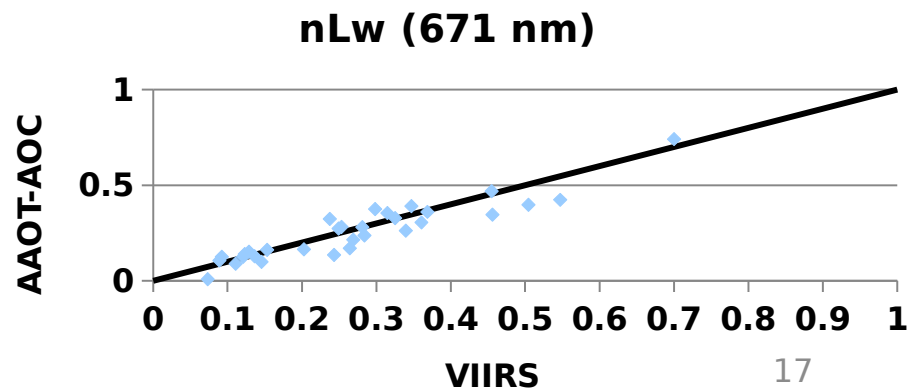
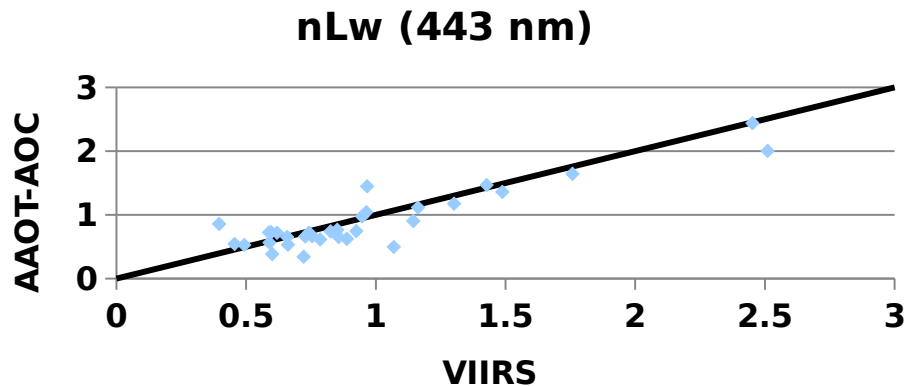
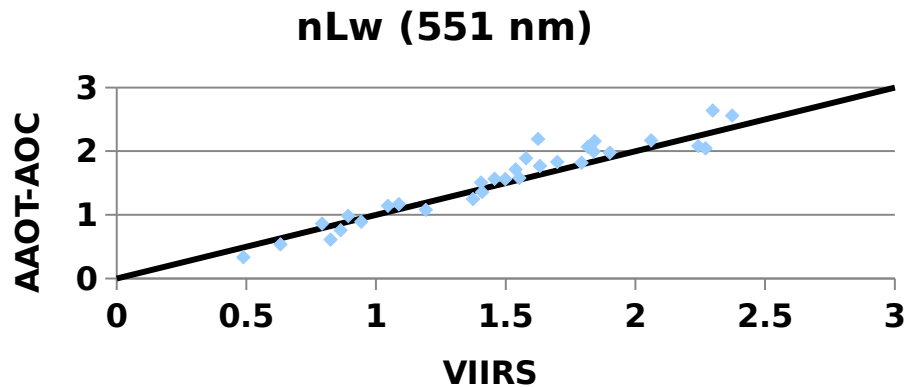
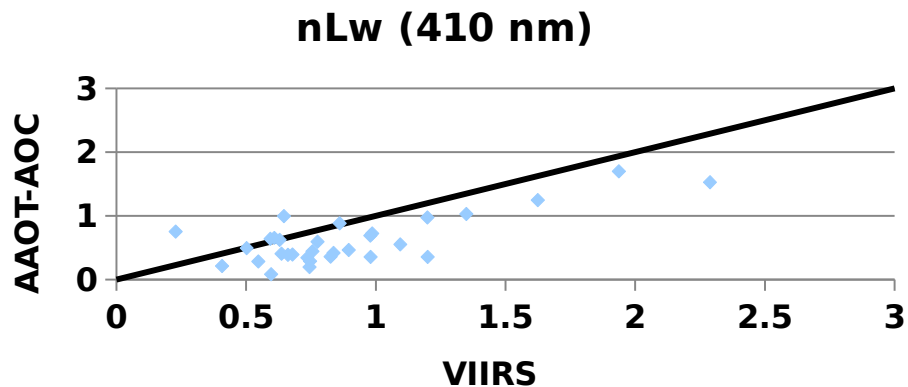
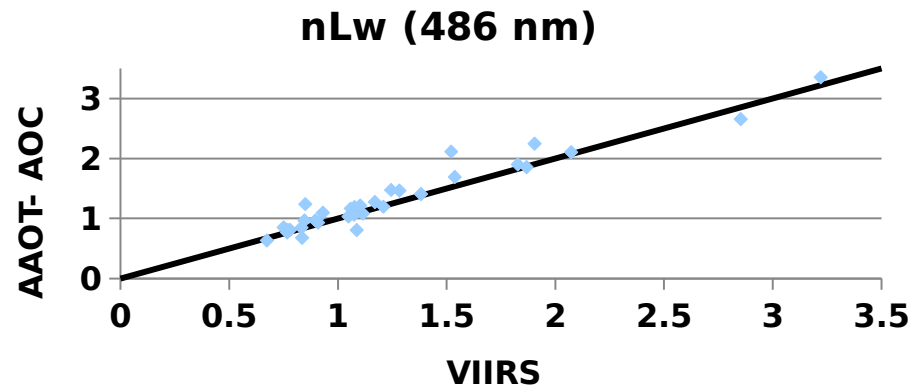
*the APS to VOCCO matchups are not screened for wind speed or any of the in situ

AAOT 555nm nLw Time Series 2013 Adriatic Sea



Location: AAOT (Jan1 - Nov 20)	Julian day	# data records	# data records after exclusions applied	# data records after satellite flags
SeaPrism AOC		686	382	382
APS -processing		233	93	73
VOCCO - processing		314	143	143
APS to SeaPrism matchups		116	44	35
VOCCO to SeaPrism matchups		68	46	46
Exclusion Criteria: +/- 3hrs; Max SatZA = 56°; Max SolZA = 70°; 50% valid pixels; wind < 8m/s; max AOT 0.2				
APS to VOCCO matchups		173	55	46
* Satellite Flags: Atmos fail; High LT; cloud/ice; sea ice; low nLw; land; hi sat2; hi solZ; nav fail; High glint; max AER iteration, epsilon out of range; Moderate glint				

Spectral response Matchup AAOT: APS VIIRS vs SeaPrism nLw, screened 2013



Daily Real time Updates

<ftp://moray.dms.usm.edu/Arnone/GeoCAPE>

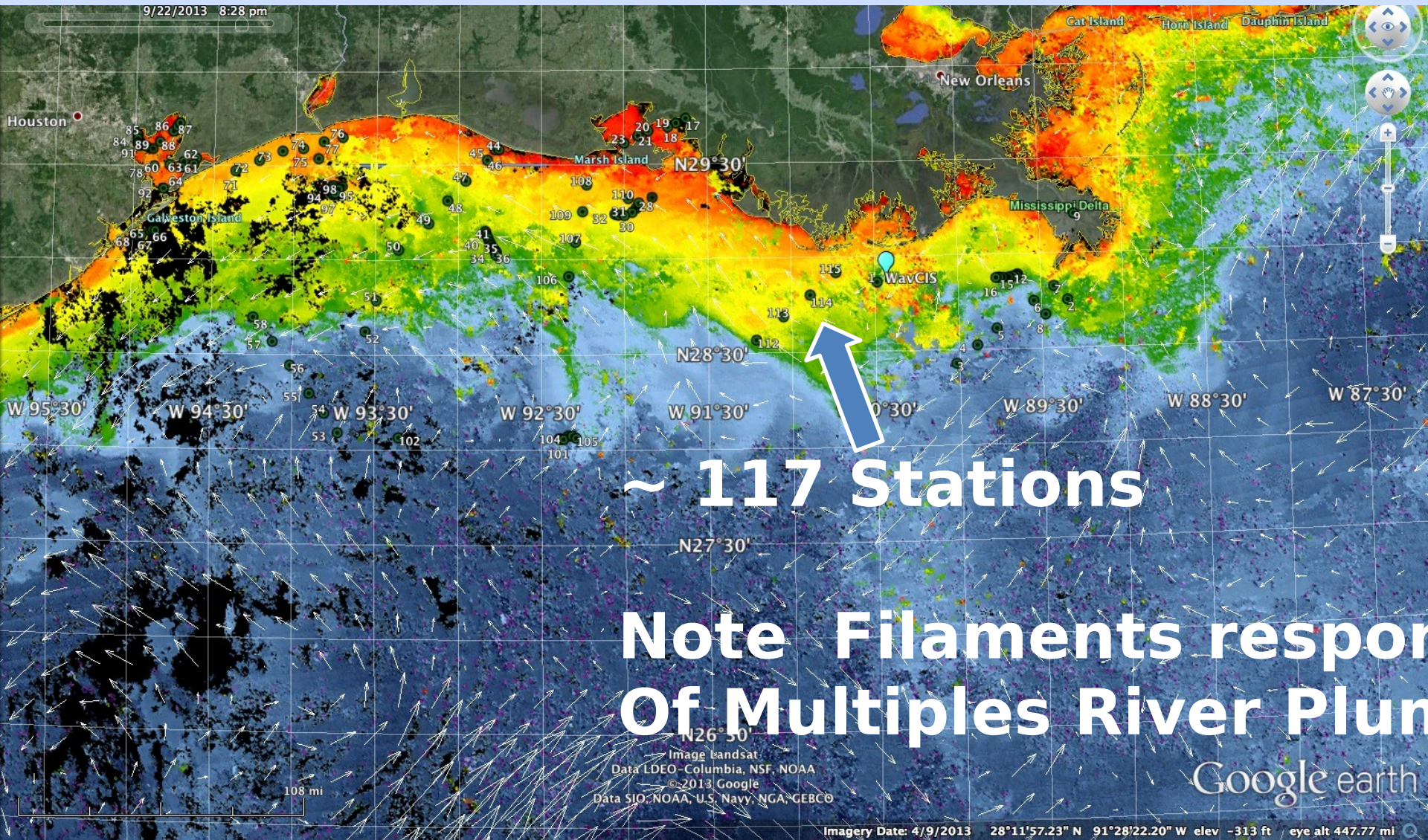
GeoCape Cruise
North West Gulf of Mexico

Sept 19, 2013

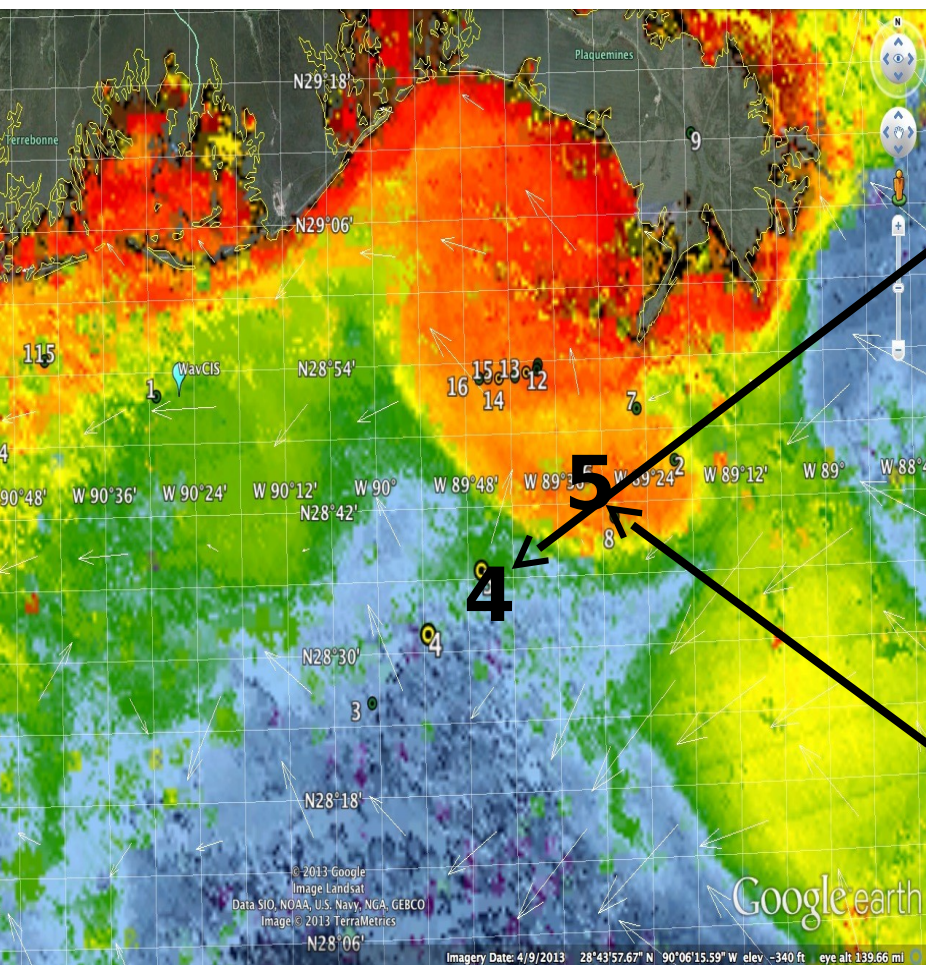
SHIP SUPPORT

Imagery and Models
NPP Chlorophyll and AmSea
Model

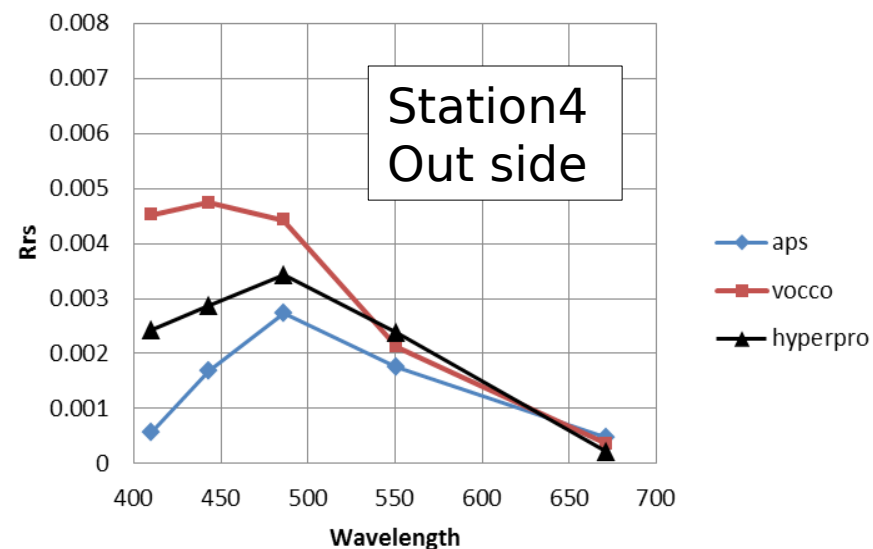
GeoCape Animation Sept 9 - 22, 2013 - Stations NPP - Chlorophyll



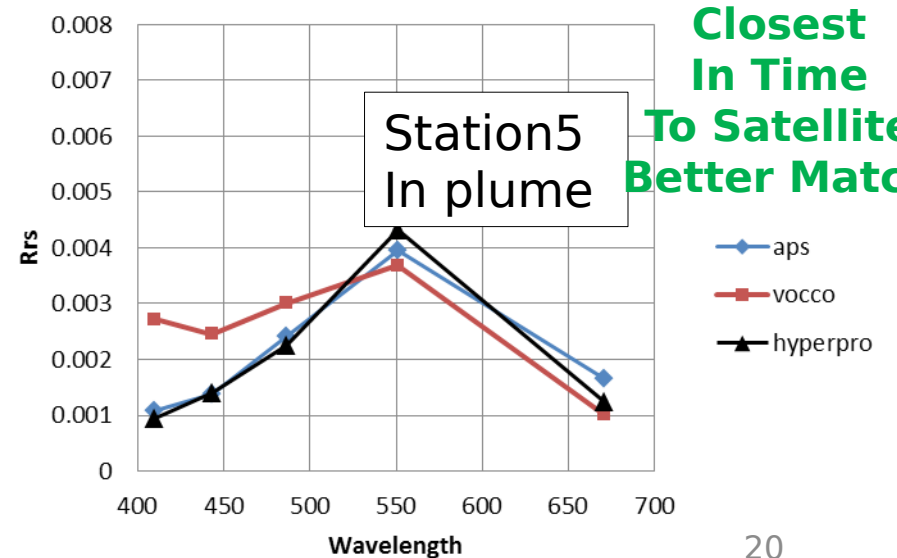
GEOCAPE Matchups - September 10, 2013



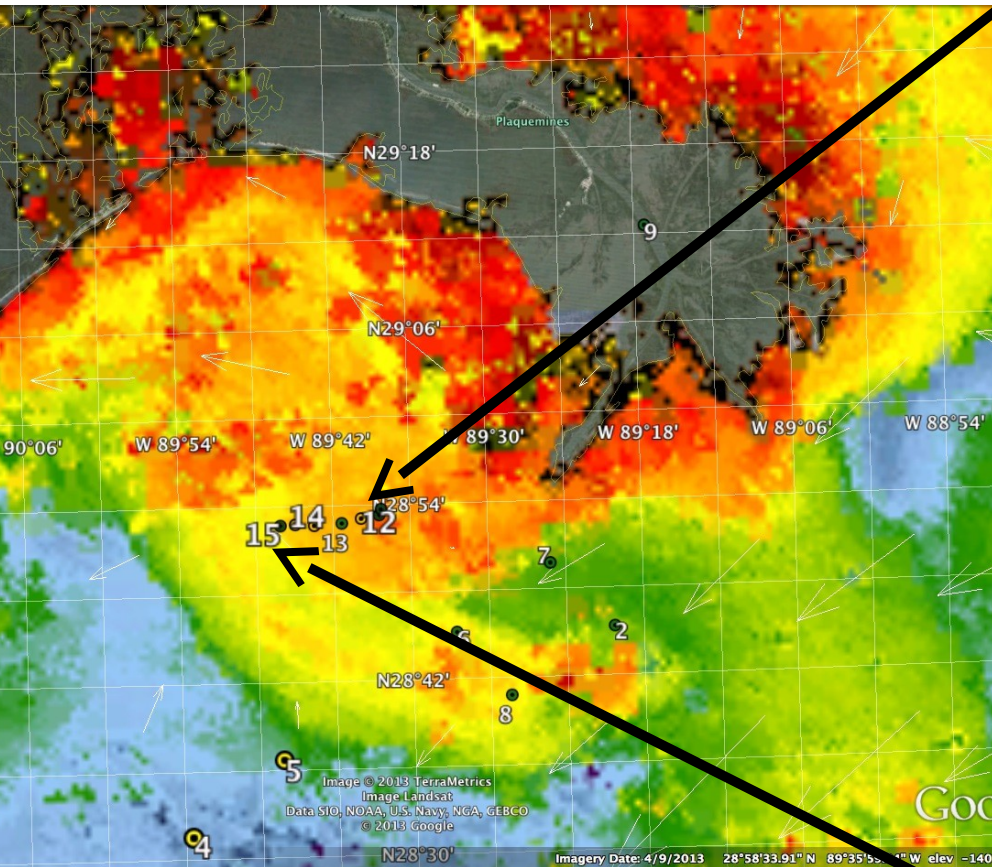
GEOCAPE Cruise 9/10/13 - 1745/1900 GMT



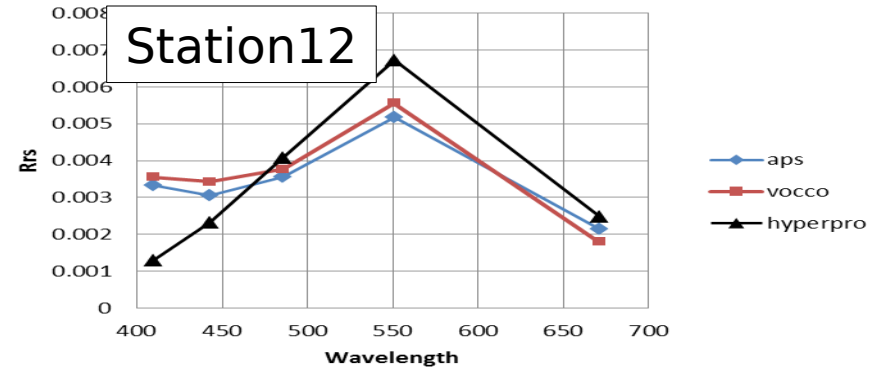
GEOCAPE Cruise 9/10/13 - 2047/1900 GMT



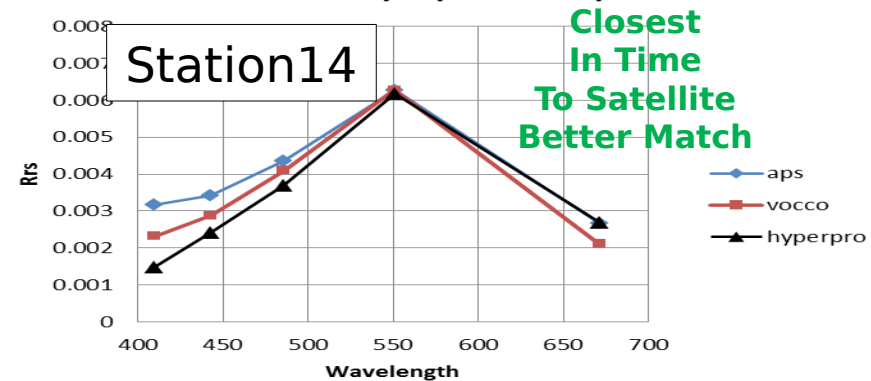
GEOCAPE Matchups - September 11, 2013



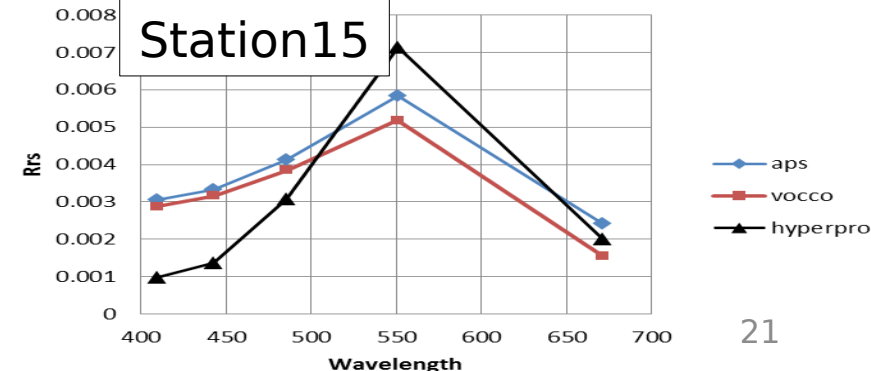
GEOCAPE Cruise 9/11/13 - 1446/1900 GMT



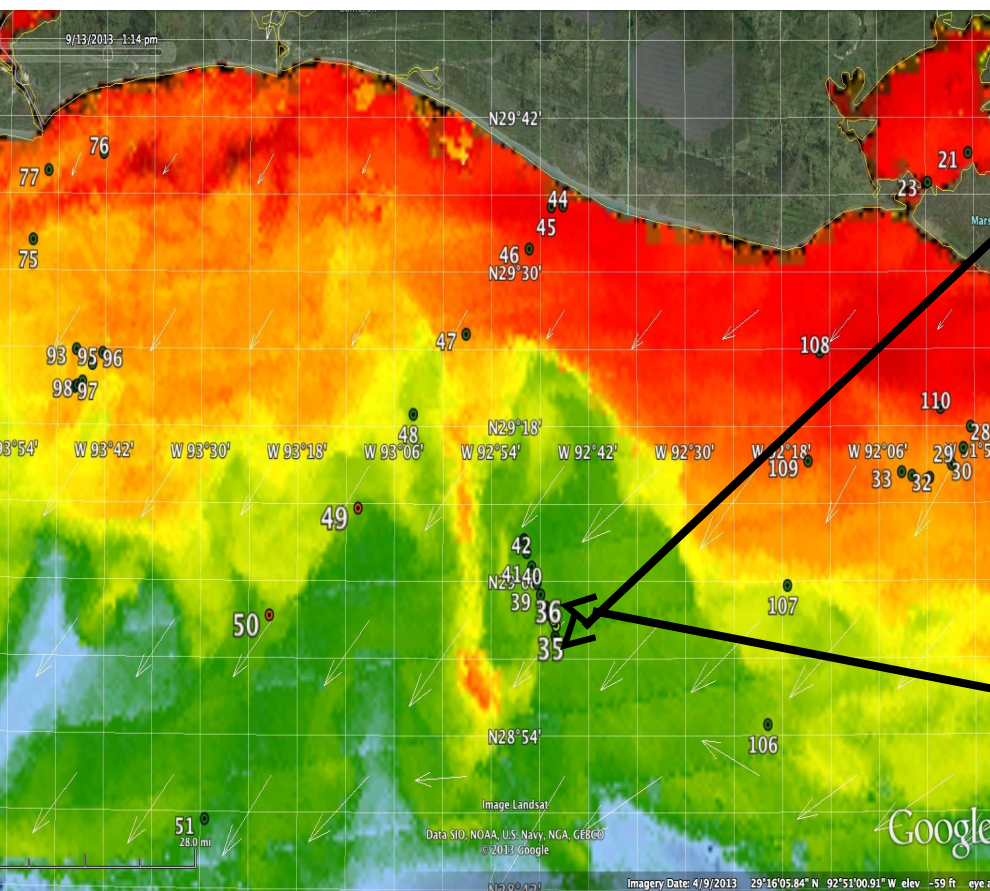
GEOCAPE Cruise 9/11/13 - 1916/1900 GMT



GEOCAPE Cruise 9/11/13 - 2241/1900 GMT



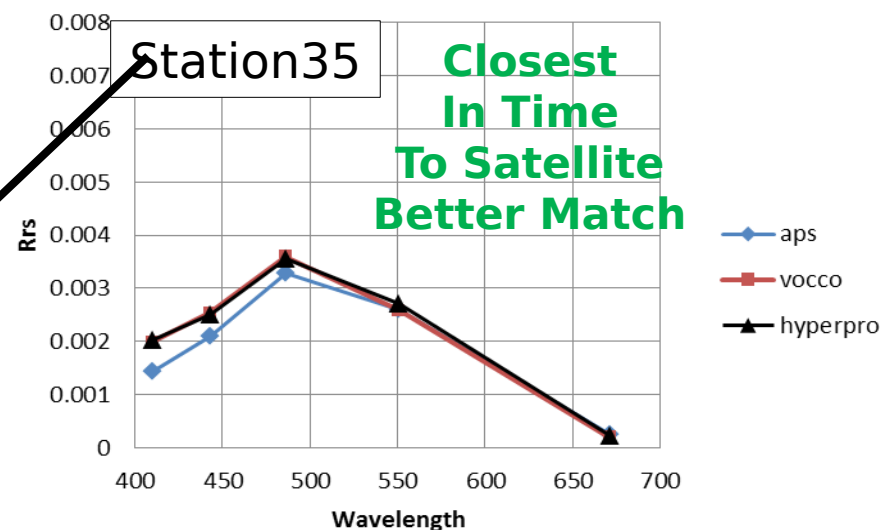
GEOCAPE Matchups - September 13, 2013



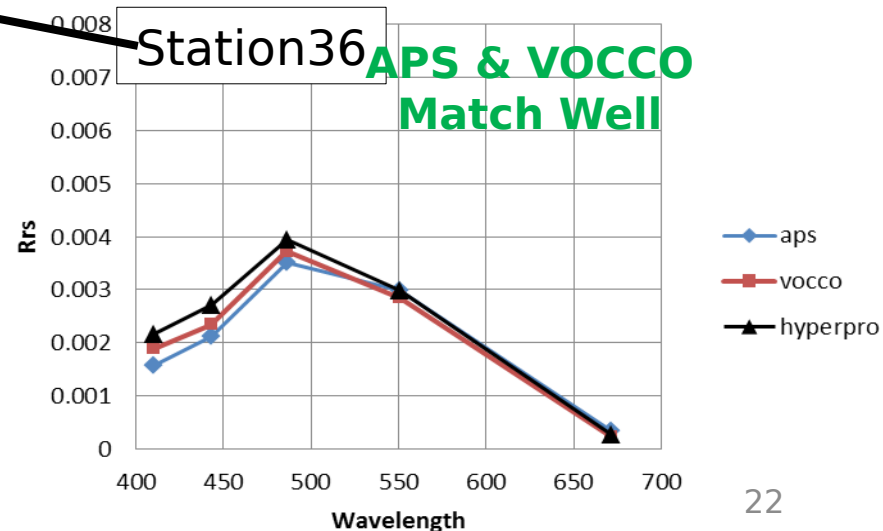
Sept 13, 2013
NPP - VIIRS - Chlorophyll



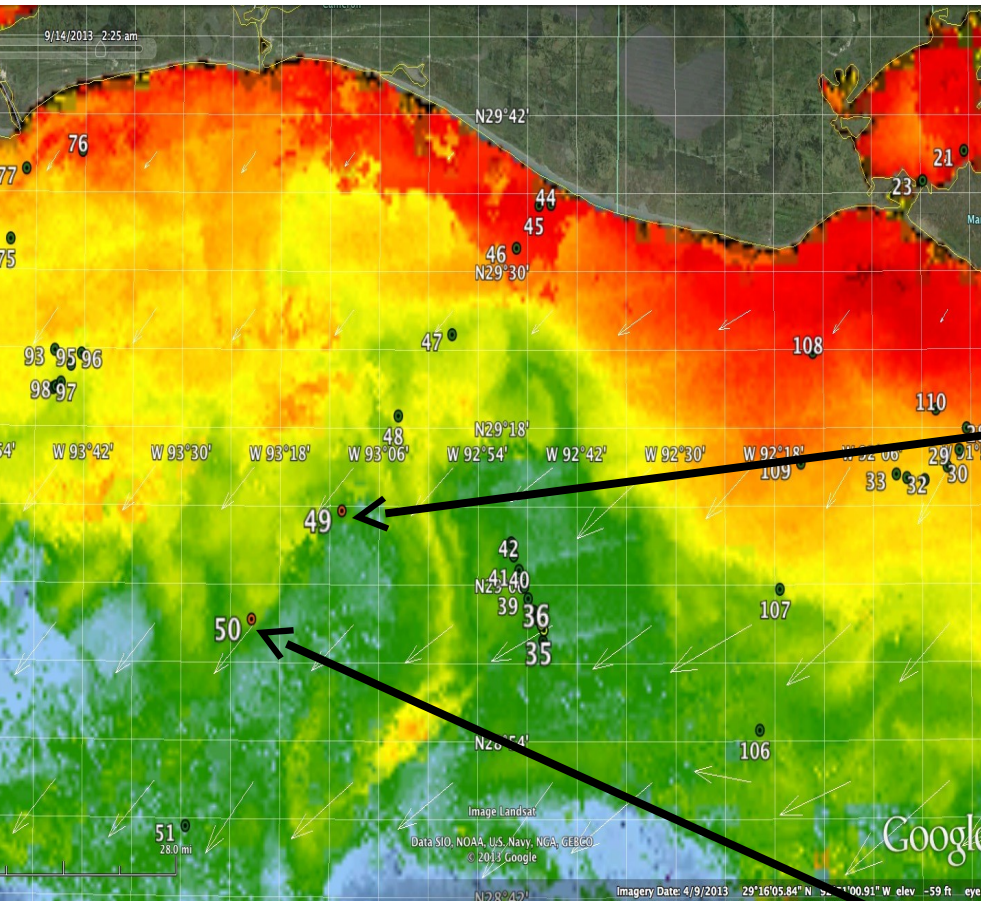
GEOCAPE Cruise 9/13/13 - 1820/1900 GMT



GEOCAPE Cruise 9/13/13 - 2020/1900 GMT

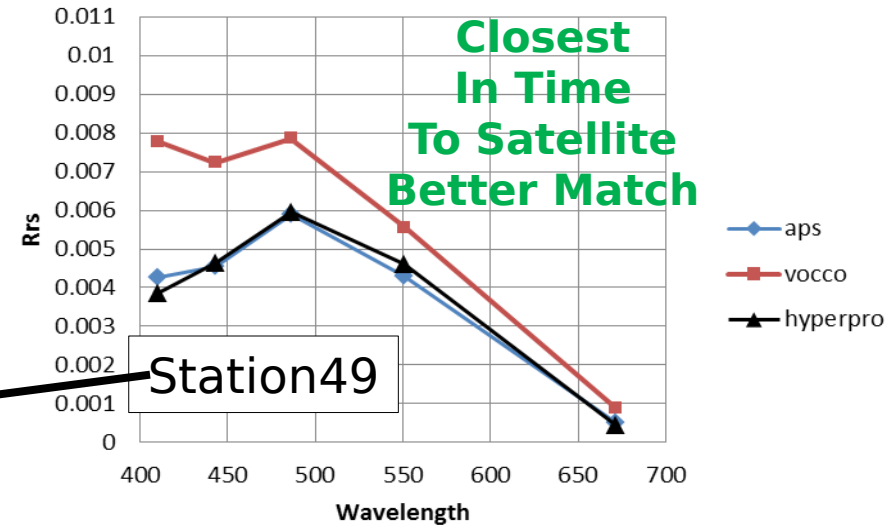


CAPE Matchups - September 14, 2013

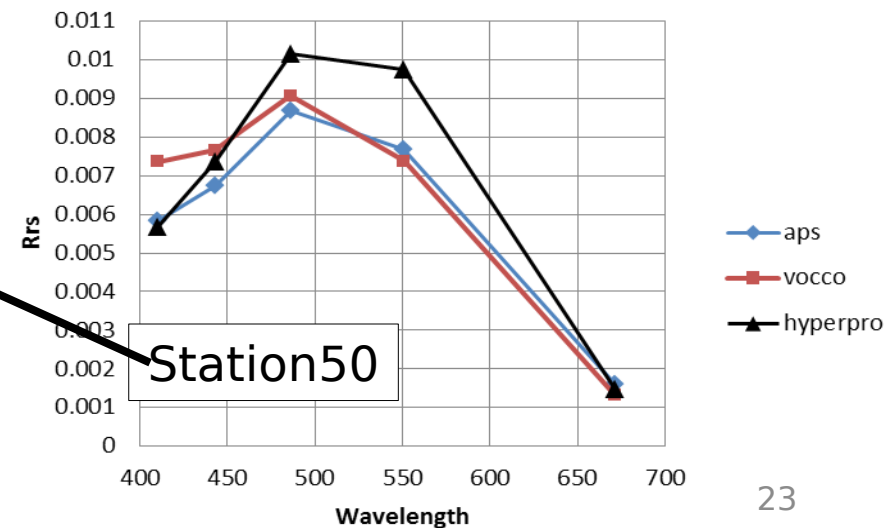


Sept 14, 2013
NPP - VIIRS - Chlorophyll

GEOCAPE Cruise 9/14/13 - 2031/1900 GMT



GEOCAPE Cruise 9/14/13 - 2268/1900 GMT



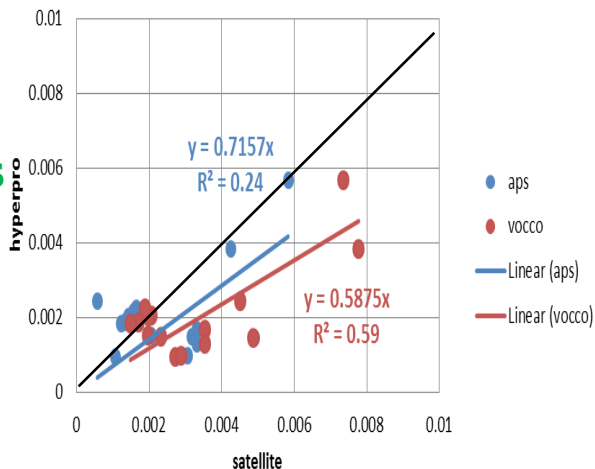
GEOCAPE Statistics - September 09, 11, 13, 14, 2013

**APS & VOCCO
Producing
Similar Results**

**APS closer
To insitu**

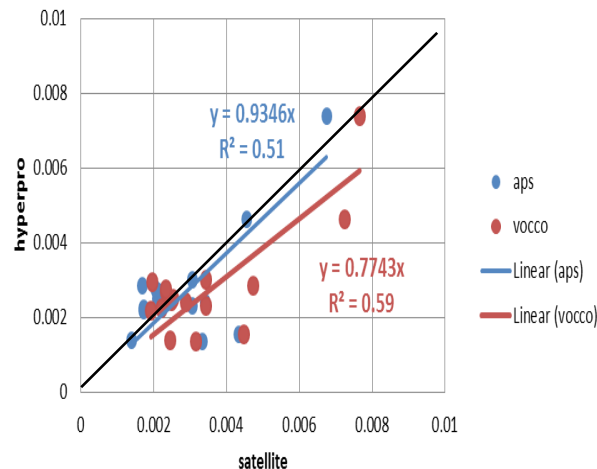
GEOCAPE Cruise 9/10, 9/11, 9/13, 9/14 - 16 Stations

Rrs 412nm



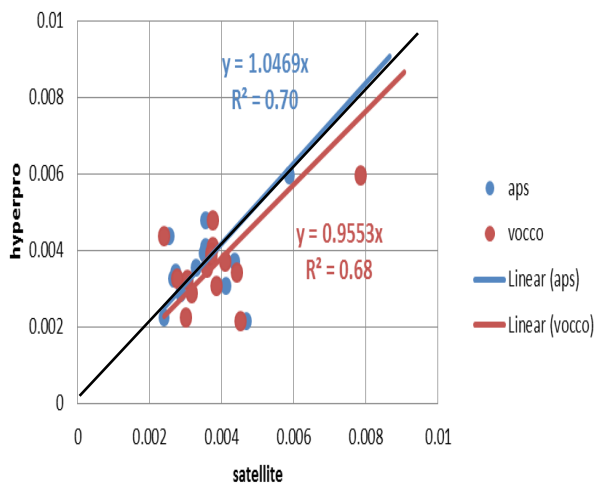
GEOCAPE Cruise 9/10, 9/11, 9/13, 9/14 - 16 Stations

Rrs 443nm



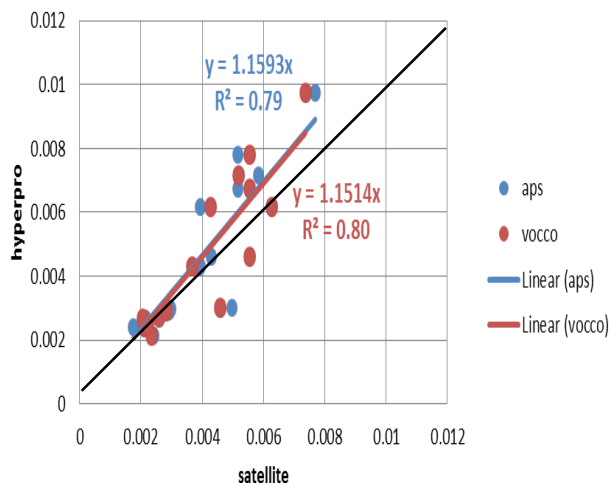
GEOCAPE Cruise 9/10, 9/11, 9/13, 9/14 - 16 Stations

Rrs 486nm



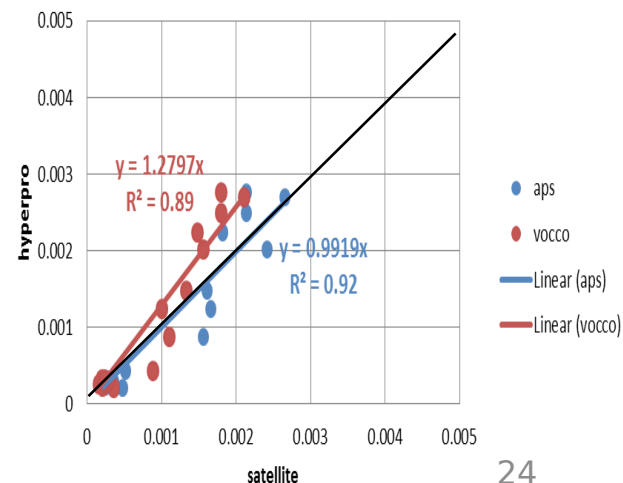
GEOCAPE Cruise 9/10, 9/11, 9/13, 9/14 - 16 Stations

Rrs 551nm

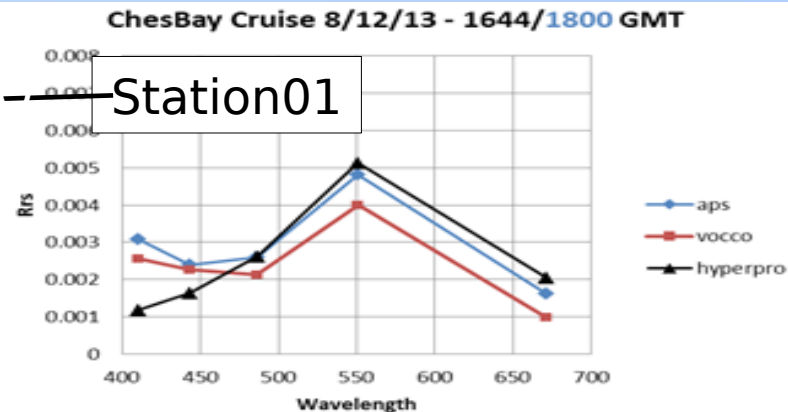
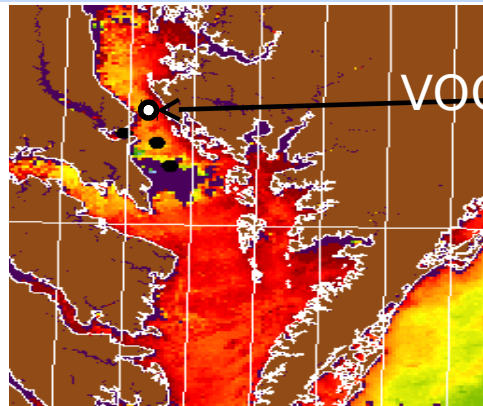
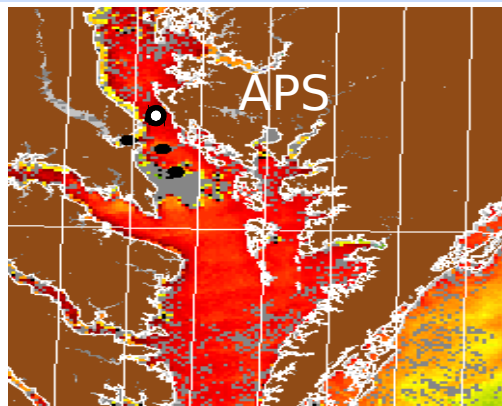


GEOCAPE Cruise 9/10, 9/11, 9/13, 9/14 - 16 Stations

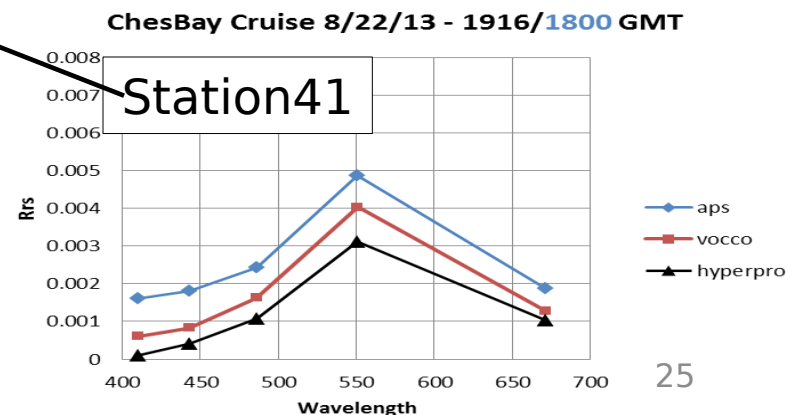
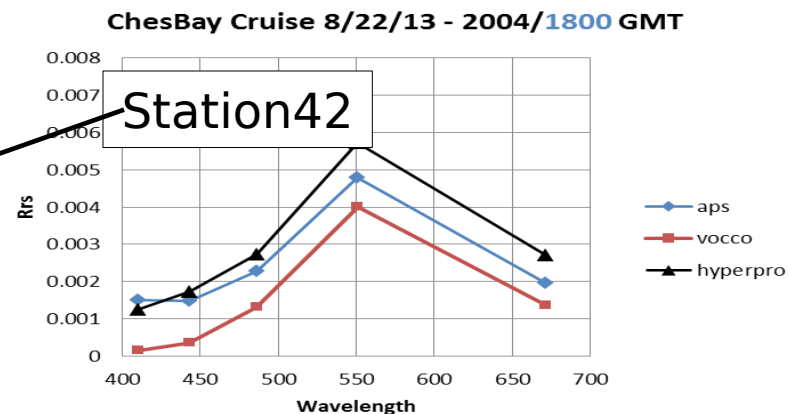
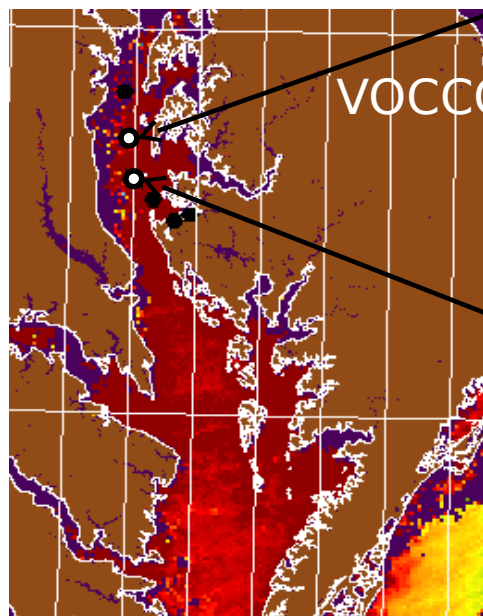
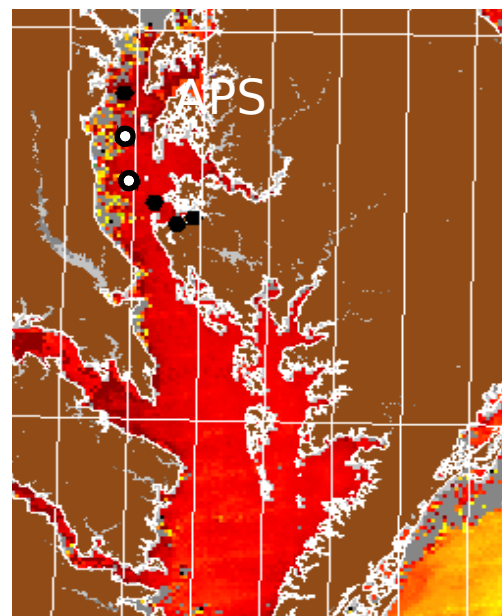
Rrs 671nm



Chesapeake Bay Matchups - August 2013

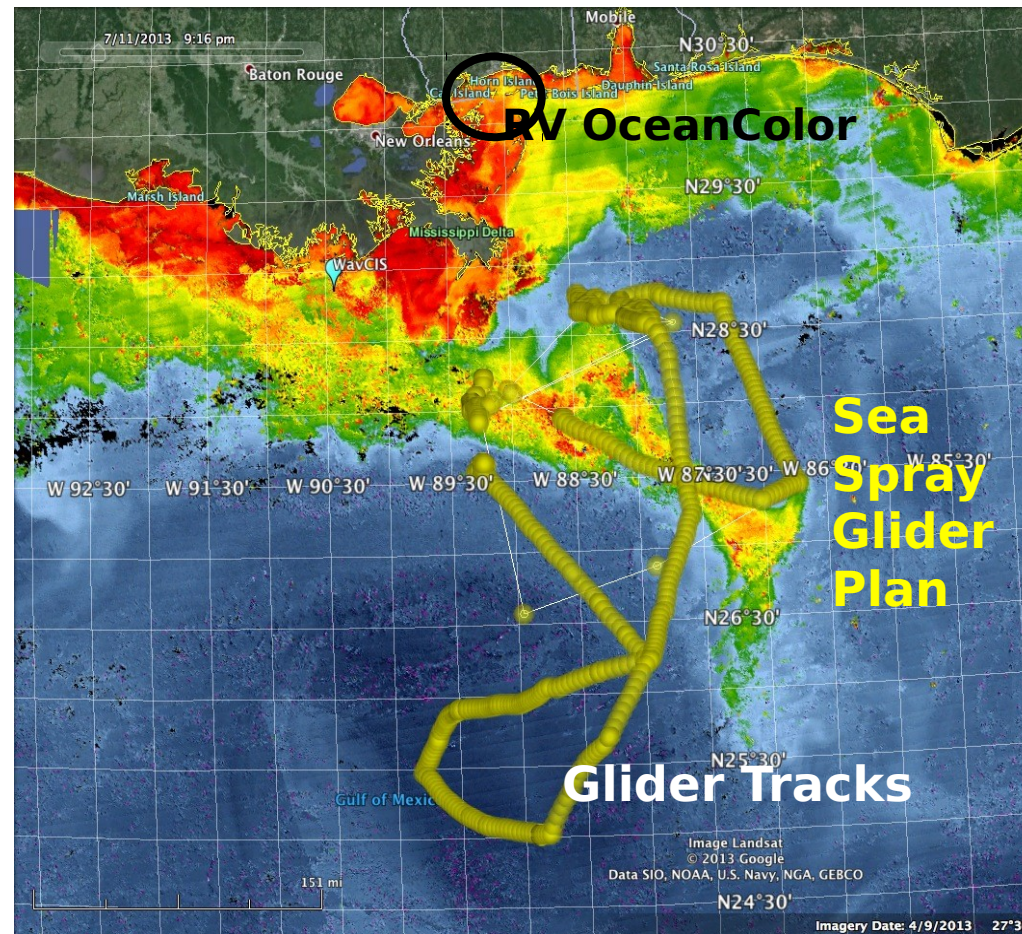


Matchups getting better in coastal regions
for both APS and VOCCO



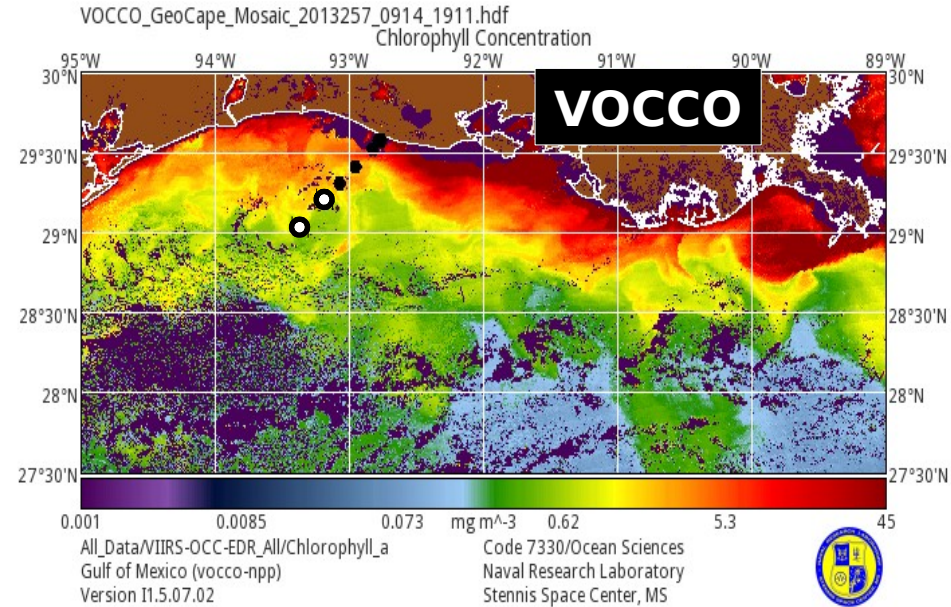
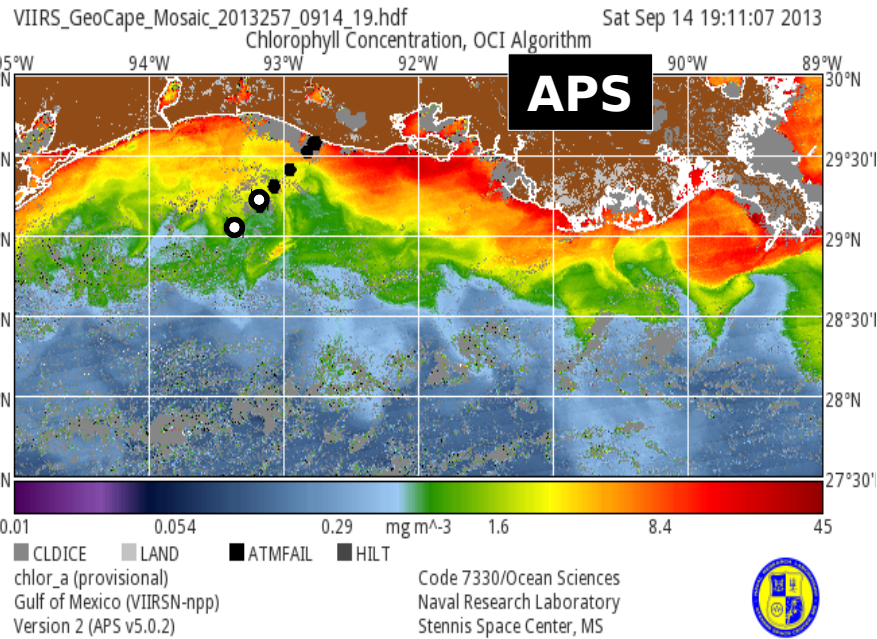
Plans:

- **Glider Sea Spray - 3 month -Aug - Oct Wet labs puck - Fluorescence, BB**
- **NRL R/V Ocean Color**
11/20/13 Above Water Radiances, In-Water IOP's / Profiles, Flowthru System (CTD, AC9, Filtered AC9)
- **Aeronet Exploring Coastal adjustments**
 - Spectral Vicarious Gain Adjustments
- **Papers at:**
 - Ocean Sciences and
 - SPIE - Baltimore

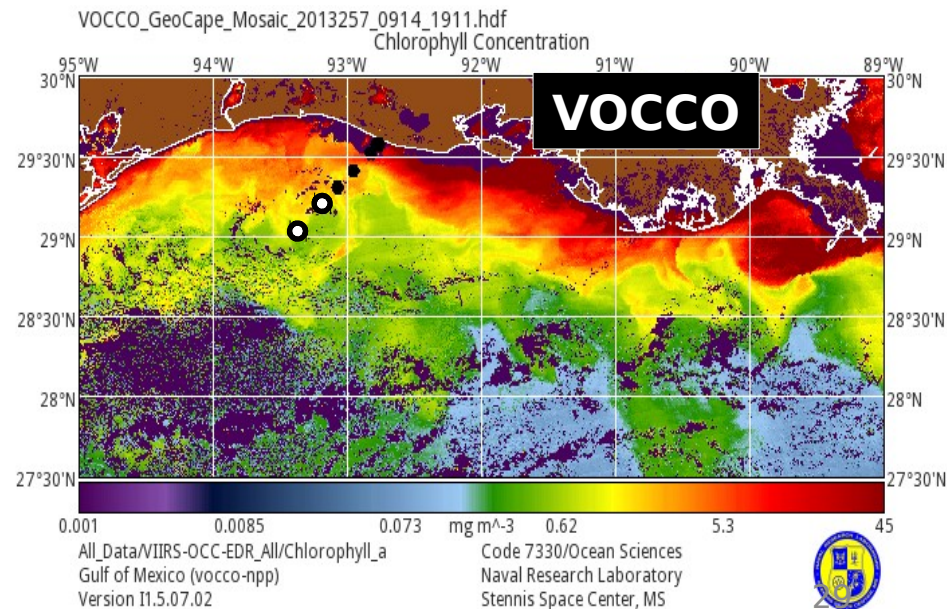
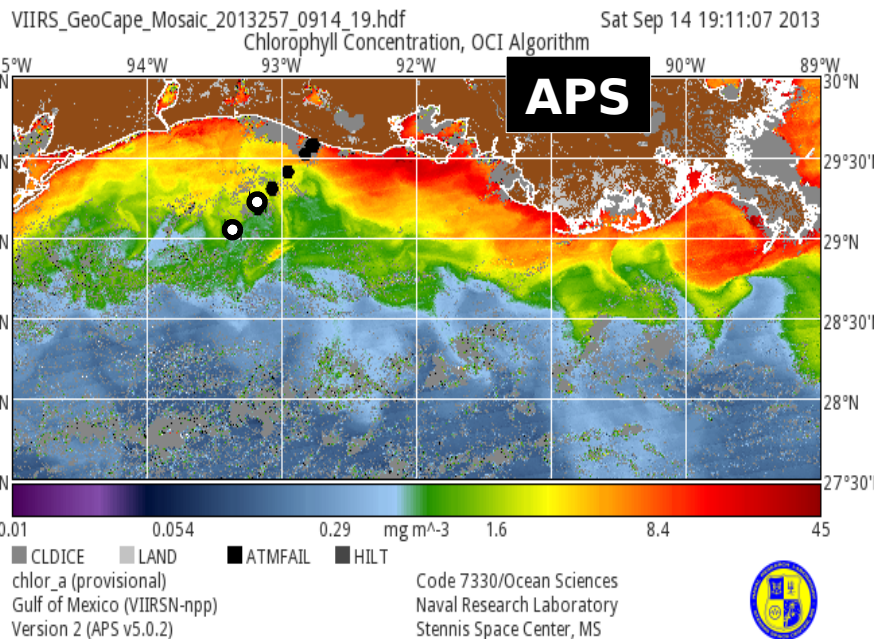
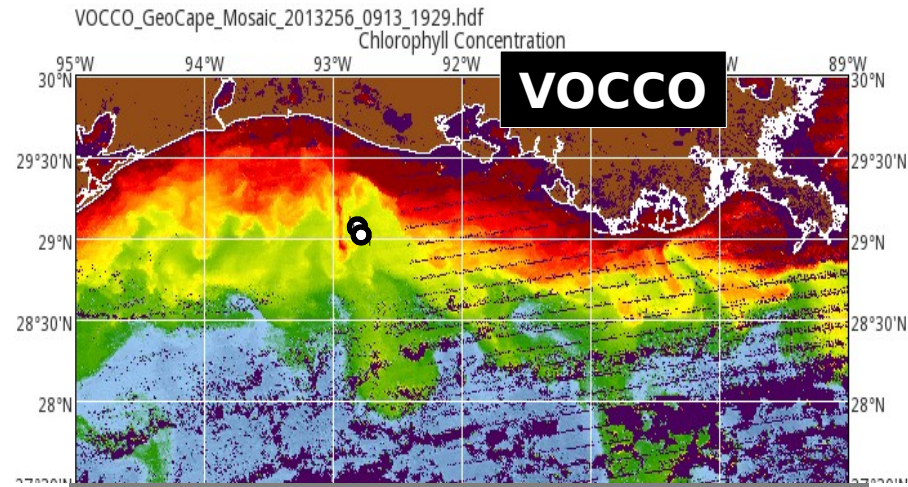
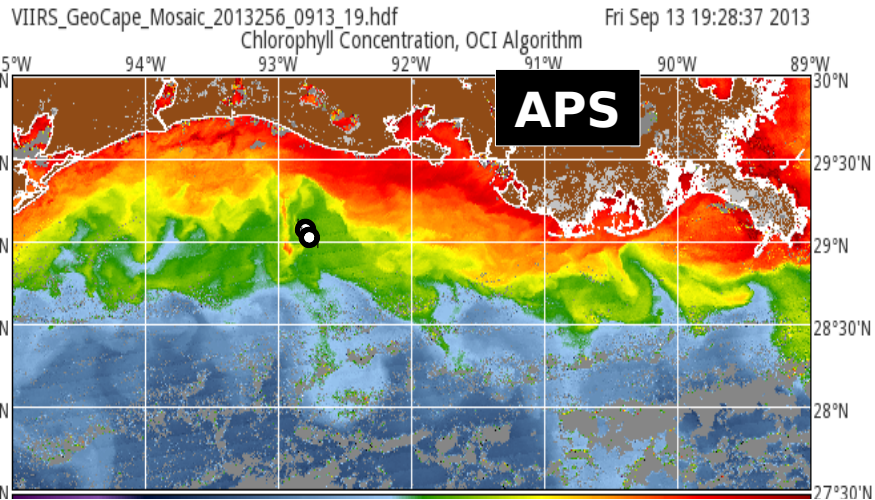


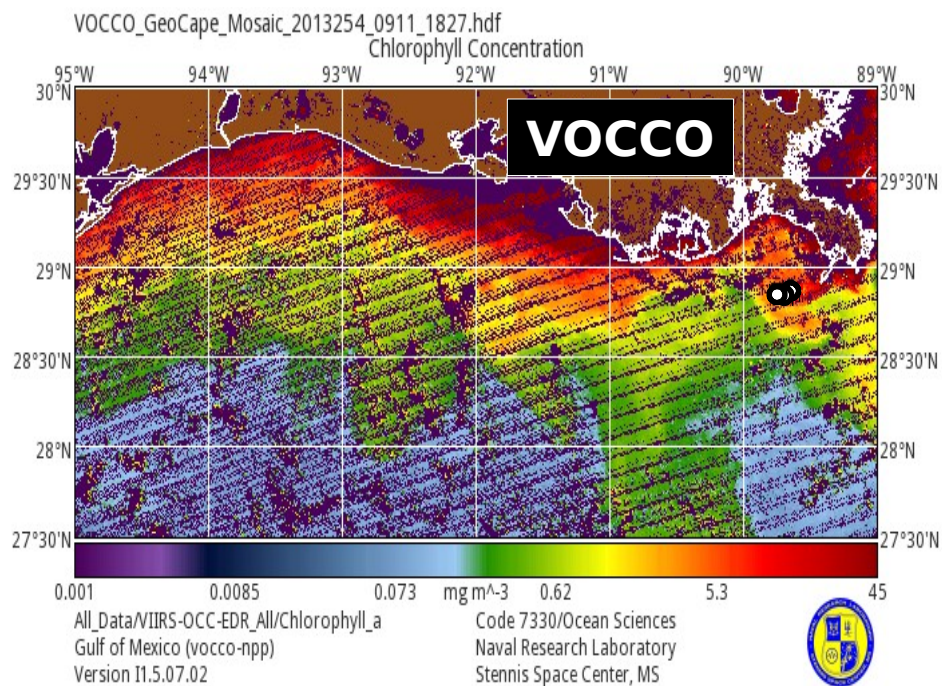
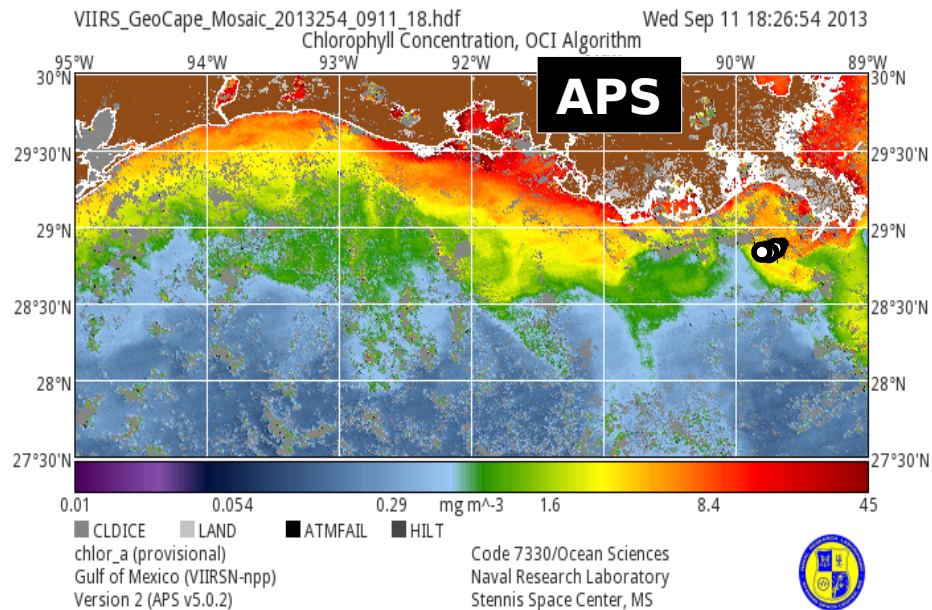
Backup

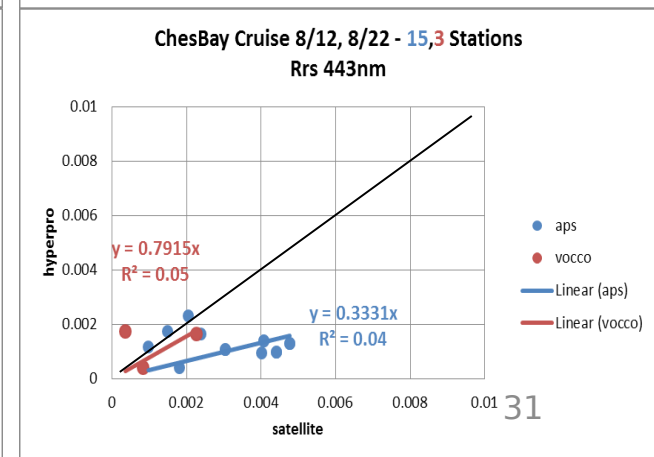
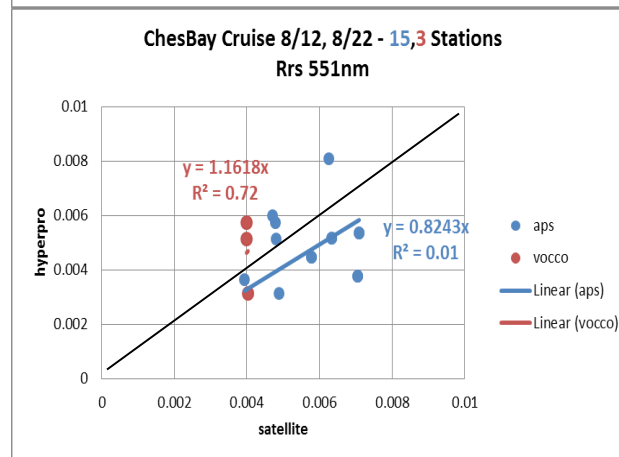
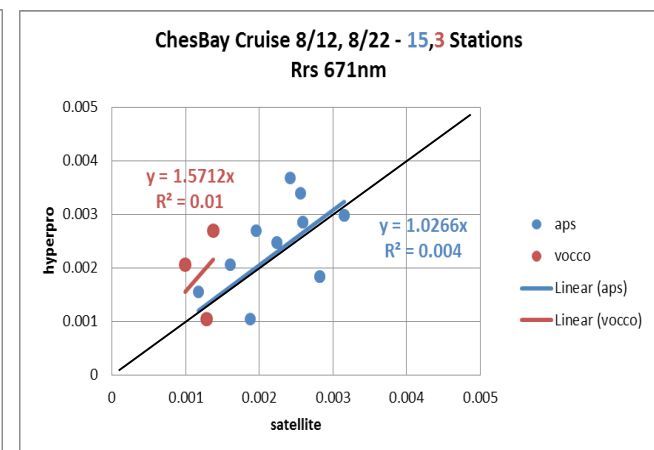
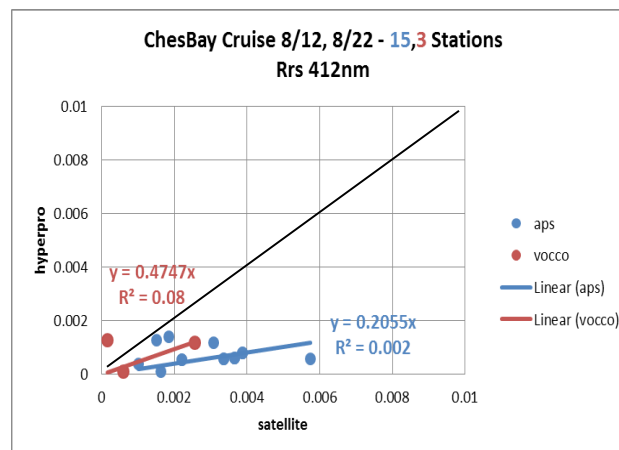
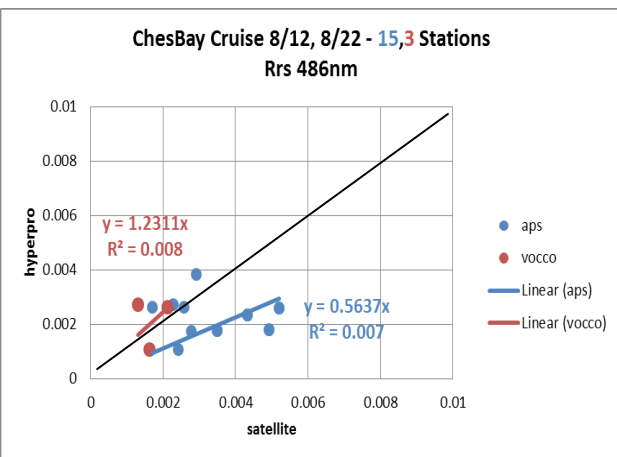
Comparisons of APS and VOCCO - Sept 14



Comparisons of APS and VOCCO - Sept 13 and 14



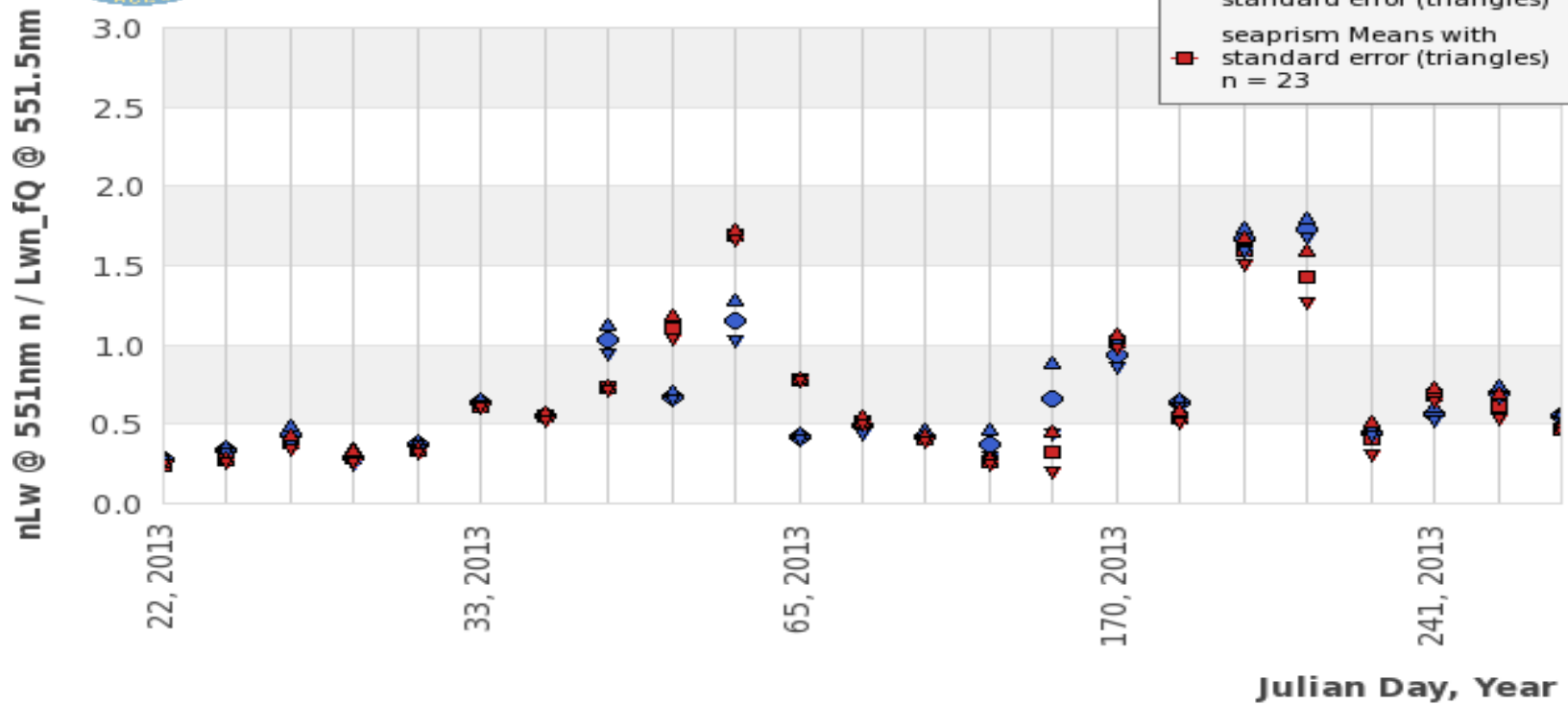




WaveCIS Time Series Analyses

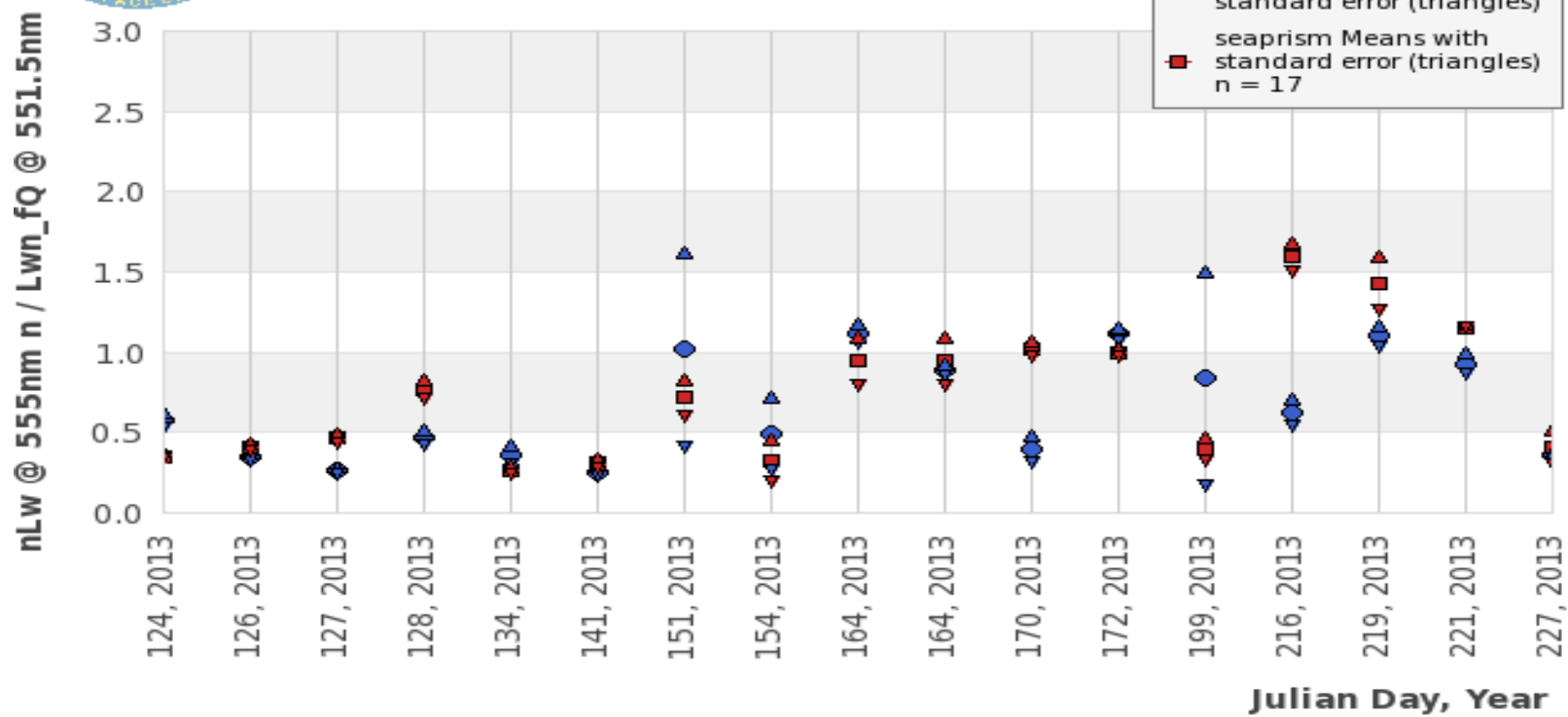


WaveCIS
viirs nLw @ 551 n 25km box mean
VS
seaprisim Lwn_fQ @ 555





WaveCIS
vocco nLw @ 555 n 25km box mean
VS
seaprisim Lwn_fQ @ 555

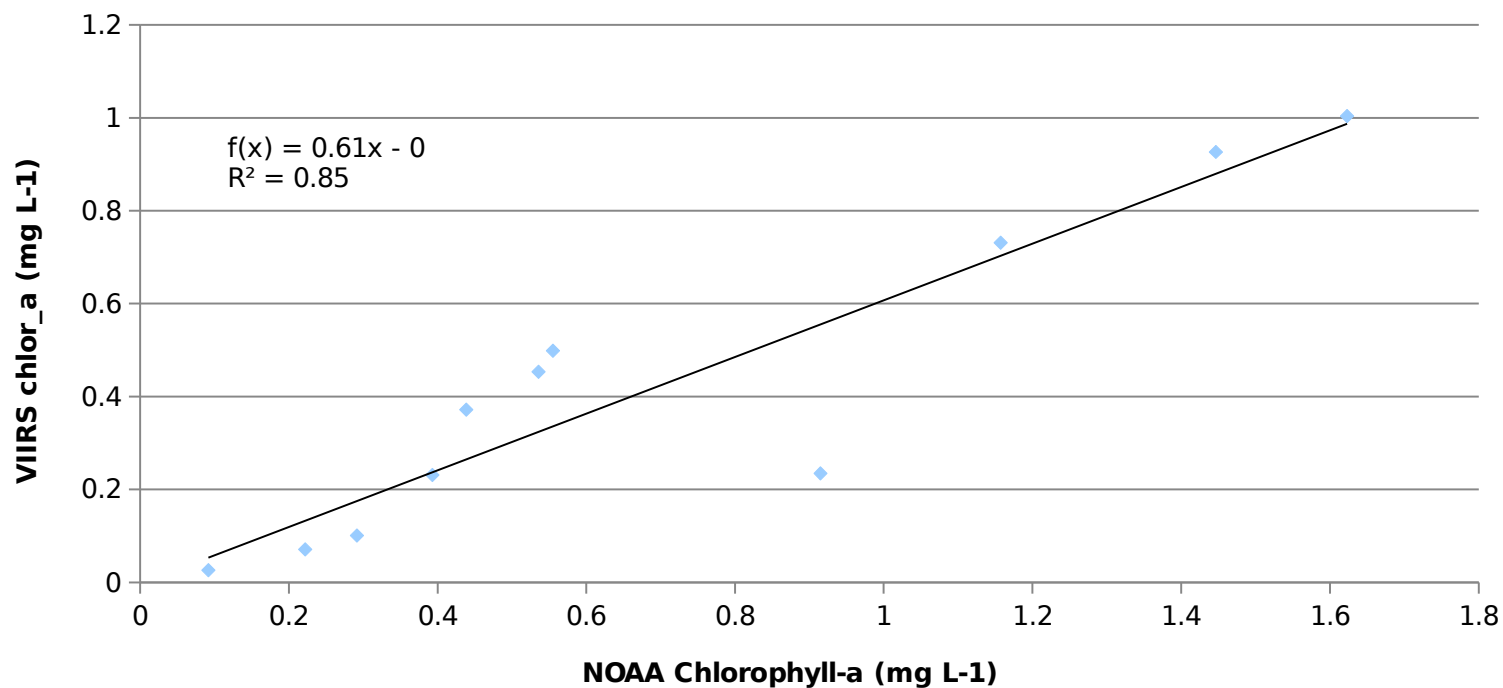


WaveCIS, 5x5 box comparison

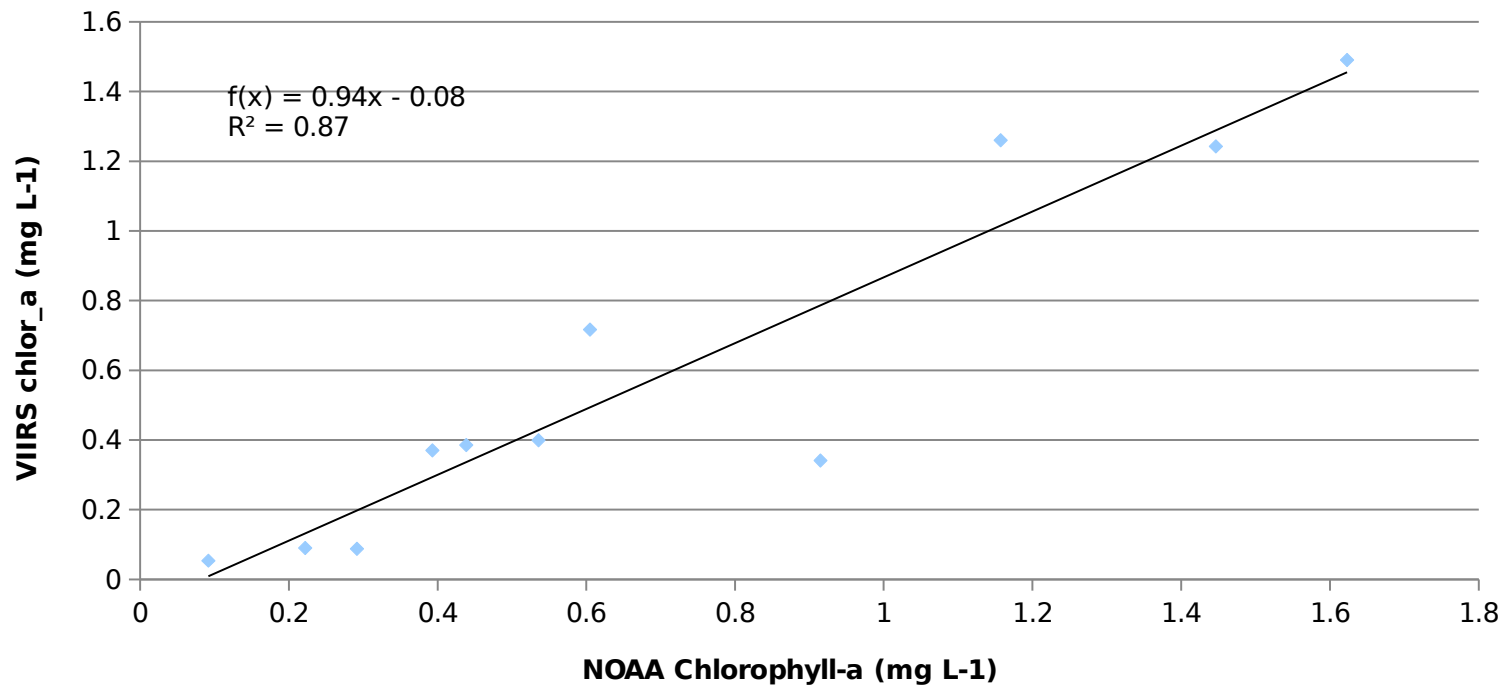
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- Min % valid pixels: 50
- Max satz: 56 degrees
- Max solz: 70 degrees
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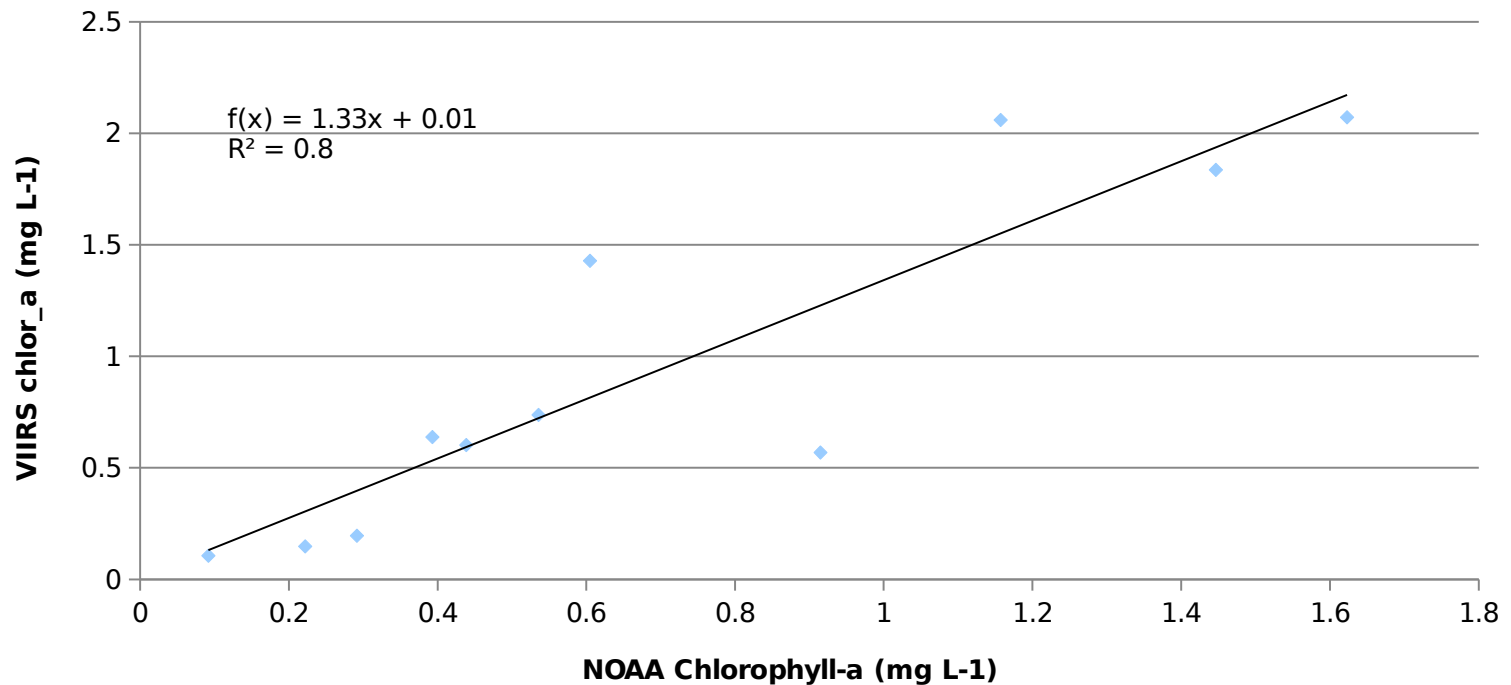
NOAA_Pisces (08/21 - 08/23 , 09/27) VIIRS matchup, IDPS



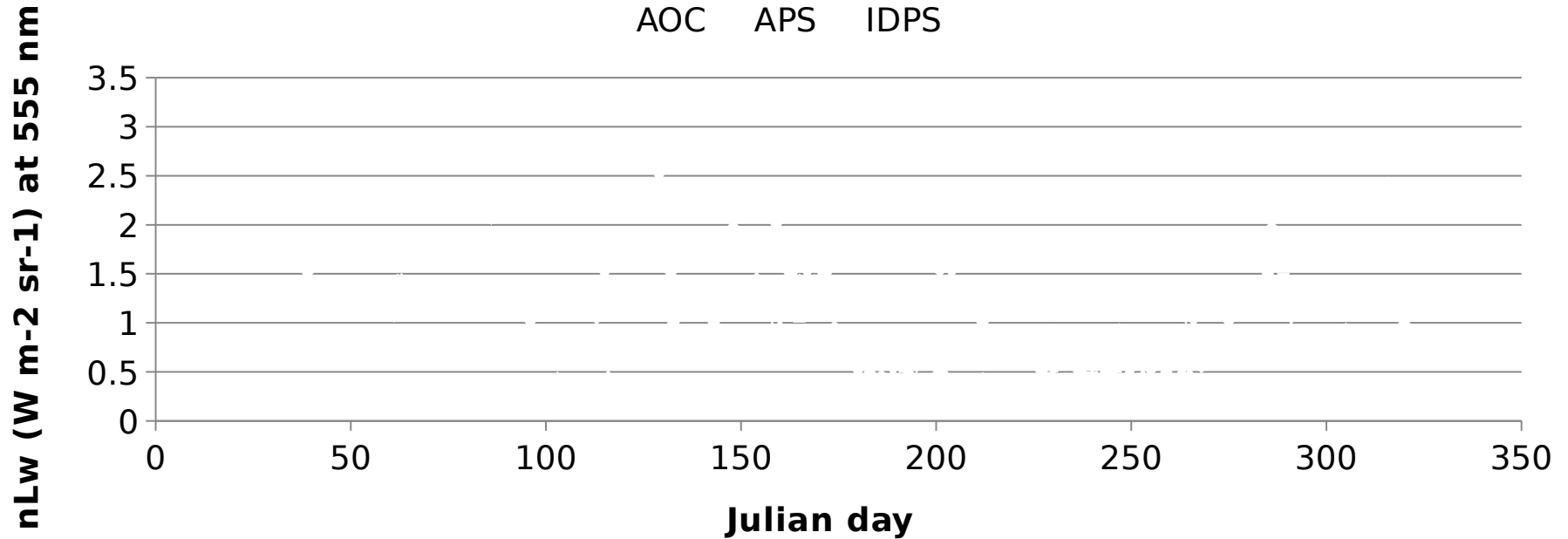
NOAA_Pisces (08/21 - 08/23, 09/27) VIIRS matchup, APS



NOAA_Pisces (08/21 - 08/23, 09/27) VIIRS matchup, APS Green gains



AAOT 555nm nLw time series 2013



Location: AAOT (Jan1 - Nov 20)	# data records	# data records after exclusions applied	# data records after satellite flags
SeaPrism	686	382	382
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VOCCO to SeaPrism matchups	68	46	46
APS to VOCCO matchups	173	55	46

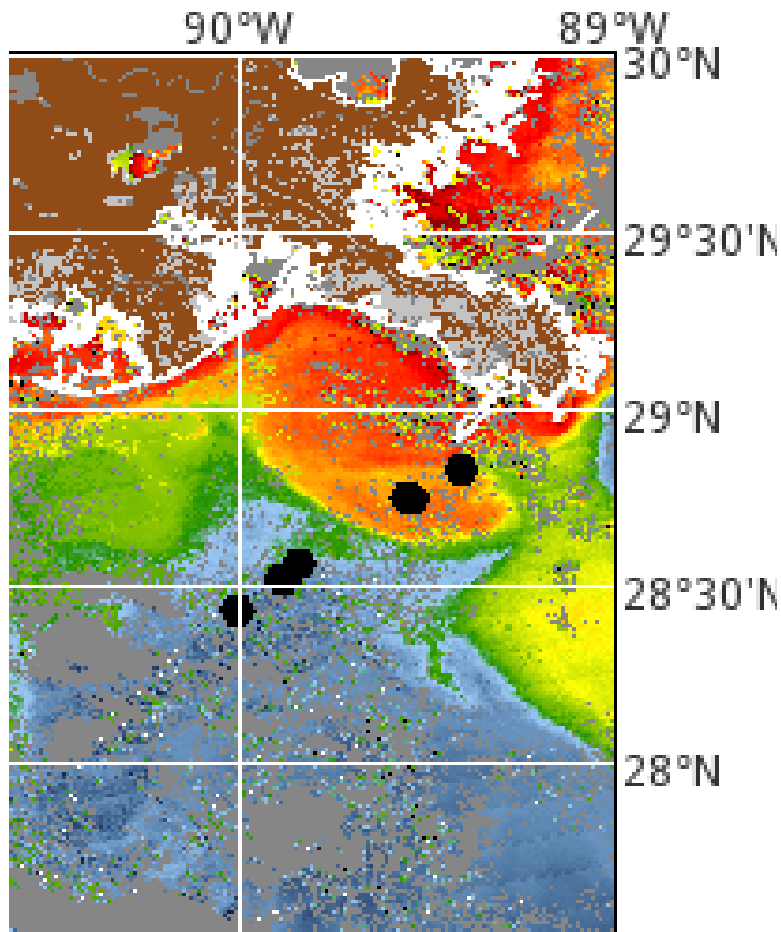
Exclusion Criteria: +/- 3hrs; Max SatZA = 56°; Max SolZA = 70°; 50% valid pixels; wind < 8m/s; max AOT 0.2

* Satellite Flags: Atmos fail; High LT; cloud/ice; sea ice; low nLw; land; hi satZ; hi solZ; nav fail; High glint; max AER iteration, epsilon out of range; Moderate glint

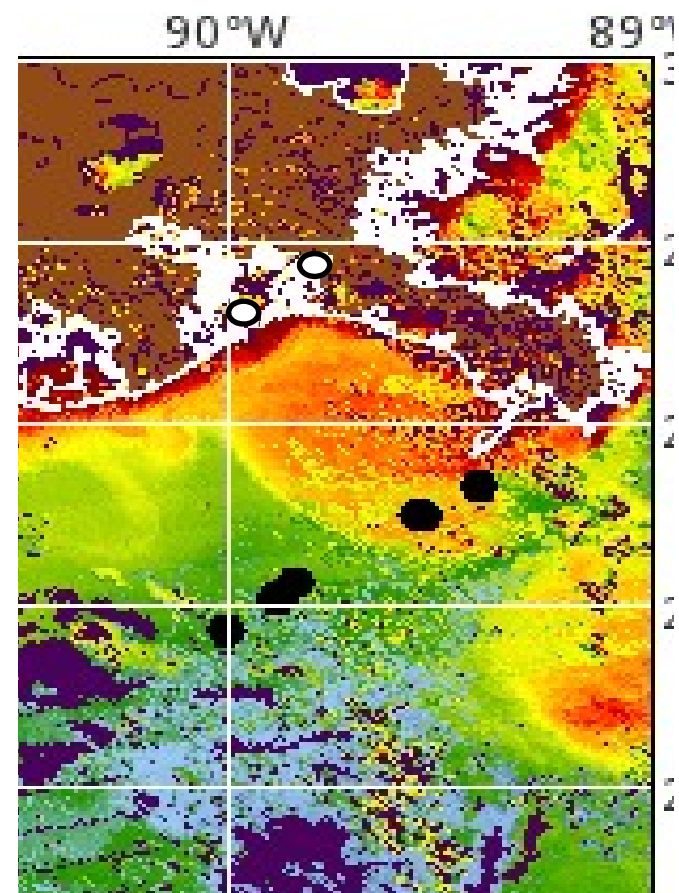
*the APS to VOCCO matchups are not screened for wind speed or any of the in situ

GEOCAPE Matchups - September 09, 2013

ue Sep 10 18:45:49 2013



APS



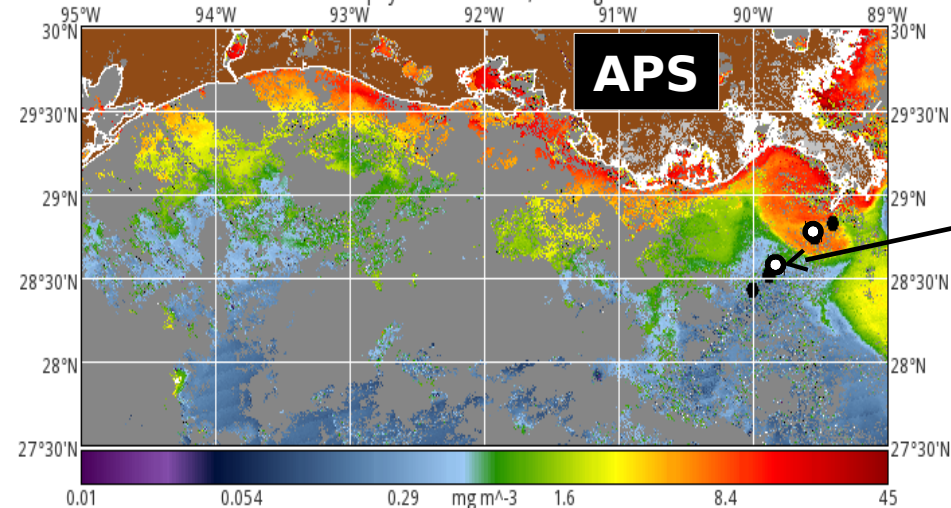
VOCCO

GEOCAPE Matchups - September 09, 2013

VIIRS_GeoCape_Mosaic_2013253_0910_18.hdf Tue Sep 10 18:45:49 2013

Chlorophyll Concentration, OCI Algorithm

APS



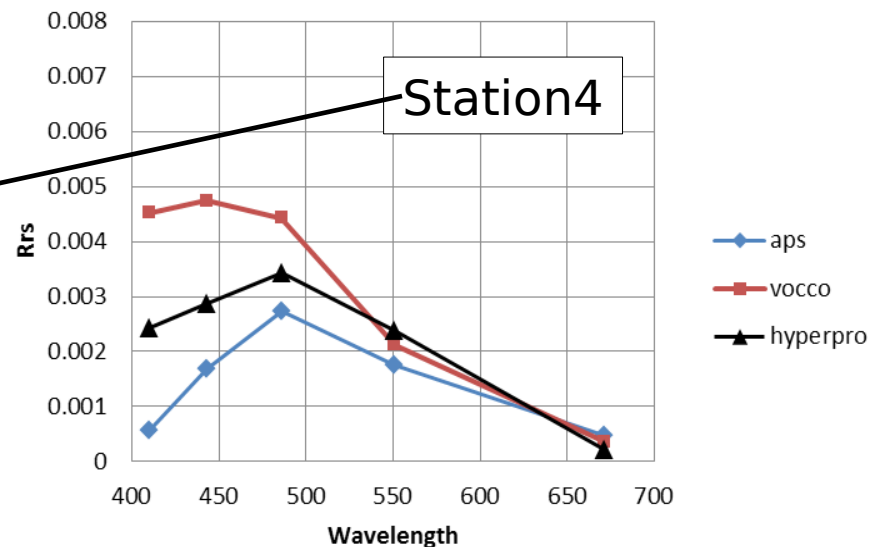
0.01 0.054 0.29 1.6 8.4 45

CLDICE LAND ATMFAIL HILT
chlor_a (provisional)
Gulf of Mexico (VIIRS-npp)
Version 2 (APS v5.0.2)

Code 7330/Ocean Sciences
Naval Research Laboratory
Stennis Space Center, MS



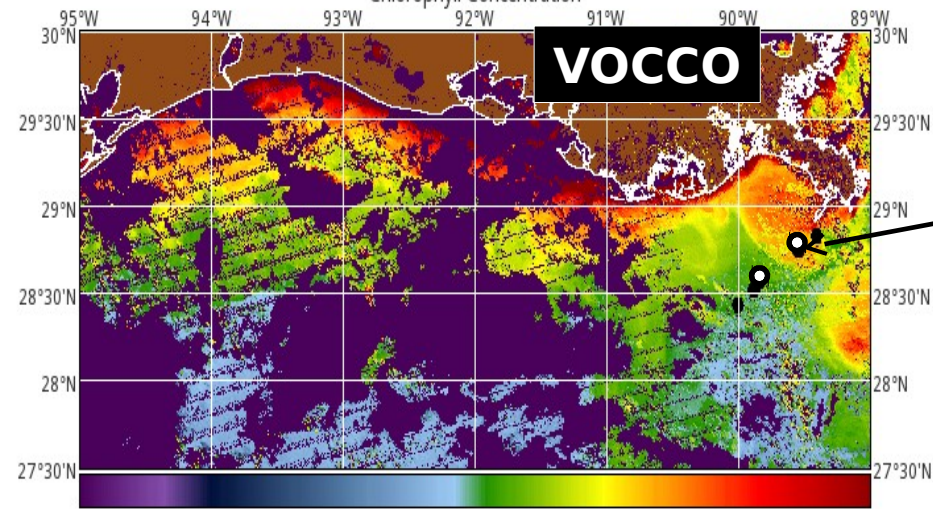
GEOCAPE Cruise 9/10/13 - 1745/1900 GMT



VOCCO_GeoCape_Mosaic_2013253_0910_1845.hdf

Chlorophyll Concentration

VOCCO



0.001 0.0085 0.073 0.62 5.3 45

All_Data/VIIRS-OCC-EDR_All/Chlorophyll_a
Gulf of Mexico (vocco-npp)
Version 11.5.07.02

Code 7330/Ocean Sciences
Naval Research Laboratory
Stennis Space Center, MS



GEOCAPE Cruise 9/10/13 - 2047/1900 GMT

